

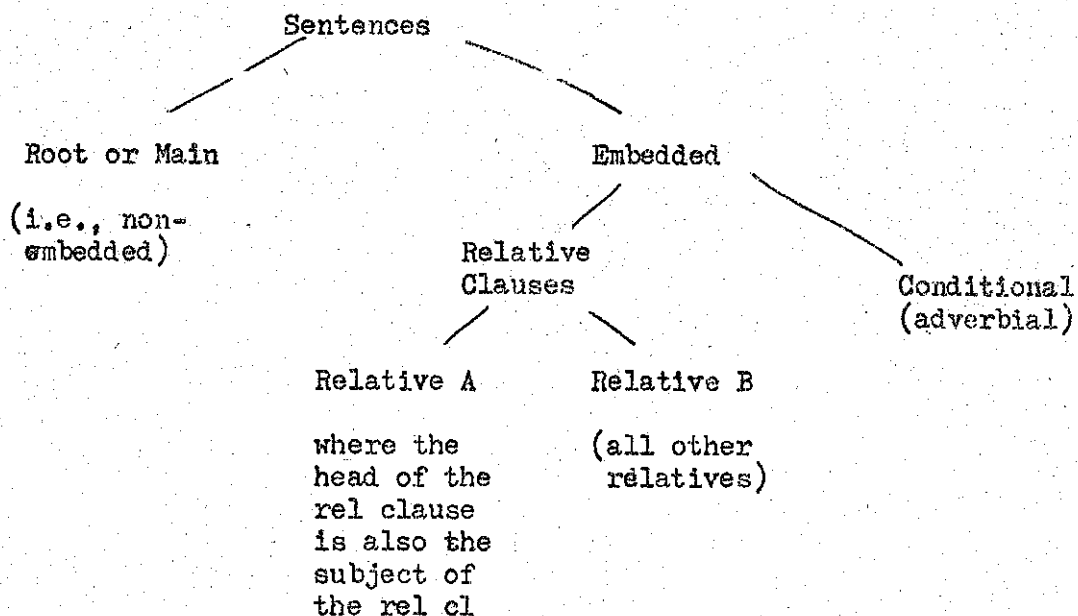
Igbo Tonology

1. Introduction to Verbal Forms

There are a large set of phrasal tone forms in Igbo. That is, the actual tone pattern of the subject NP, the verbal elements, and the direct object are determined not only by their lexical tonal specifications, but also by the particular syntactic configuration they are placed in. There are certain patterns for non-embedded clauses, others for embedded clauses of various types; syntactic - semantic considerations such as (i) sentence negation and (ii) the "I/II" distinction (which we will consider in detail below) are also crucial in determining the actual tone pattern.

For the present, we shall use the following subcategorization, following, on the whole, Green and Igwe:

(1) Grammatical dimensions



(2) I/II Distinction (morphological/semantic)

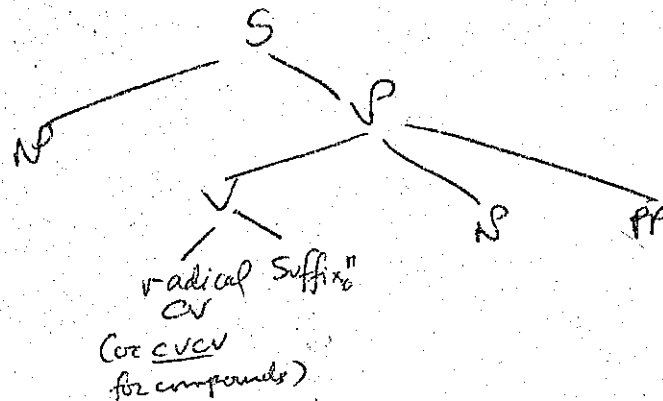
In theory, these two types of distinction -- (1) and (2) above -- are completely independent: that is, there might be 8 forms, 4 of type I and 4 of type II.* For the present, we shall consider only affirmative forms: that is,

* in fact, not all possibilities are distinct
see below _____

those with an overtly positive sense.

The I Forms

The form of all the affirmative I forms is essentially:



2.1 I Main

In this form, the verb is Low (save for a few important exceptional verbs, a point we shall return to shortly). The tonal form of the object is unaffected -- that is, it retains its lexical tone. The subject NP undergoes a tonal rule, however. When the subject NP ends in a H tone, that H becomes a falling tone, falling from the High it would have had in isolation to the Low pitch of the verb stem.

For example, the name Adhá is thus in isolation; in the sentence (2), the second syllable becomes Falling.

(2) Adhá hùrù nwókó. "Adha saw a man"

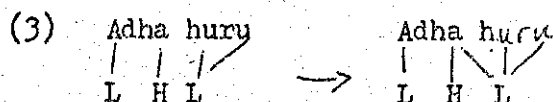
^ Saw m

which is "saw" "man"
The lack of this information in subsequent examples makes this unworkable

Within the framework developed so far, there are three conceivable ways of dealing with this tonal phenomenon. It is, of course, our goal to develop a theory which decides, just as the language learner must, which is the correct solution.

(1) First, the contour tone might arise from a floating Low tone, specific to this verbal form. It would cliticize leftward onto the subject, causing a High tone to become Falling, and leaving a Low tone essentially unchanged.

(2) Second, the contour tone might arise from a characteristically autosegmental rule (what I have called a "Flop" rule). In essence, the change would be as in (3).



Third, there might be a (non-autosegmental) rule which copies the stem tone onto the final vowel of the subject.

A priori -- or rather, given the limited experience we have to this point -- we have no way to choose among the solutions. ((Recall that this notion of "choice" is ambiguous: in one sense, we are seeking the linguistic "truth", and in that sense we have not yet got enough detail to know what Igbo is "really doing". In the second sense, we wish to design a theory which, given very limited data, is reduced to only one method of description, one which then in fact turns out to be the correct choice in the first sense))

-- as far as I can see, if this were all the data, any choice would be possible.

2.2 There is a small class of verbs -- very common ones however -- whose tonal behavior in the I Main form is exceptional. Rather than being Low, they are Mid in tone.

We can see clearly that these verbs are tonally exceptional when the subject is a cliticizing pronoun (i.e., a singular pronoun). Such a subject is H, as in (4), not Falling or Rising. These cliticizing pronouns do not undergo the process sketched in (3).

(4) Non-exceptional verbs with clitic subject, I Main

á	cí	mana	ó	cí	ákáwá	ák	"he must carry some eggs"
Subj	carry	m	ann	á	cí	m	anú
		1st					
						ó	= he she it
						cí	= carry

When followed by an exceptional verb like iwu, we find a downstep as in (5)

when is the mid?

(5a) o wu ihye m x na ece ecice ya (it is the thing I was talking about)

b) o ka mma "it is better" ika 'surpass'

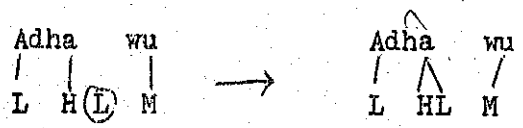
The preceding subject's final tone still undergoes a drop when the verb is one of these exceptional ones (e.g., (5)), if the subject is a non-cliticizing NP ending in a High tone.

The floating tone hypothesis above would predict that the subject would drop to a Low pitch (see (6)). How the Floating-tone hypothesis would attempt to account for the fact that in (4), e.g., there is no change of the subject's tone when it is a clitic, is unclear.^{FN}

FN: One could of course imagine a half a dozen possibilities to "handle" this fact within the floating tone paradigm. We shall see below, however, a real case of a floating tone much like the putative L-floating tone here (sect. 10.2-10.4). If there were a floating L tone here in the I Main, what we would find in (4) would be a Rising tone on the clitic subjects.

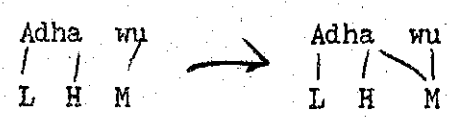
The autosegmental hypothesized sketched in (3) above would predict that the subject would drop only to a downstepped High, and would thus be level with the pitch of the following verb: see (7).

(6) Floating-tone Hypothesis



(using the circle to indicate, following Mary Clark, a floating tone)

(7) Autosegmental hypothesis




In fact, the second, (autosegmental) prediction is correct, not that of (6).

We return to the third type of possible solution alluded to above in a moment.

2.3 We are now in a better position regarding the choice of a solution in both sense. We are confronted with essentially three solutions, each corresponding to one of the major types of processes available for tonological phenomena:

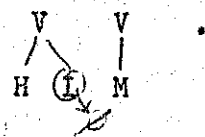
(1) morphological: this is the floating-tone hypothesis described above; it claims that the elements are inserted in the underlying form, and is thus the result of lexical processes: hence the name morphological. Given the wrong prediction it makes for the irregular verbs^{FN} and cliticizing pronoun subject tones, it can be eliminated. It further makes the wrong prediction for the object anyi when preceded by no suffixes: see sections 2.5 and 2.6 (but also FN)

FN: Will Leben points out that the form predicted by the floating-tone hypothesis as in (6), repeated here, is rather "complex" in an articulatory

(6) Adha wu adha wu


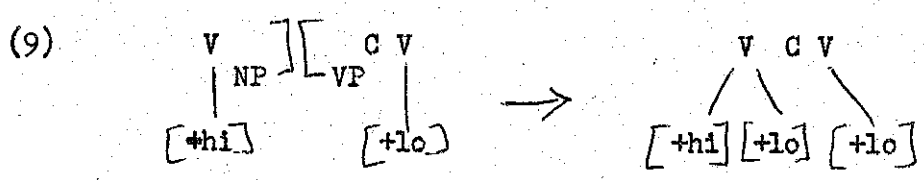
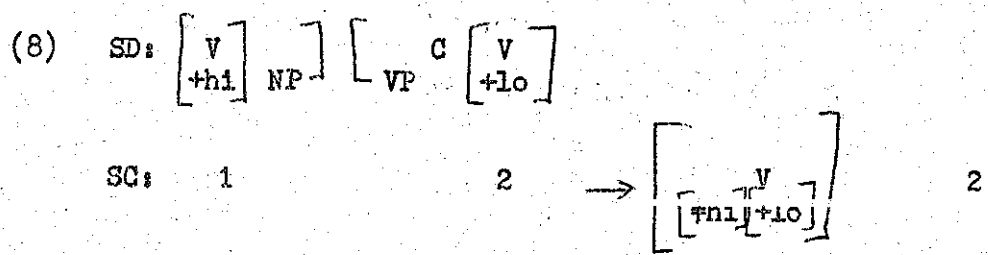
sense, and it should not be surprising to find a L-tone raised to the following High (or rather, here, Mid) in such a position. It is generally difficult to know what to say about such suggestions. The "cheaper" such low-level neutralizations are made by the theory, the more "abstract" solutions are permitted at essentially the same cost earlier in the derivation. That is, given any easily imaginable evaluation metric for phonological systems, the cheaper are late neutralization rules, the more different systems can be constructed within the system that produce the same superficial results. Given the understanding of generative grammar discussed immediately below, this increase in equally (or nearly equally) valued solutions amounts to a weakening of the empirical force of a theory.

In any event, there is no independent language-internal (i.e., Igbo-internal) evidence for a rule:



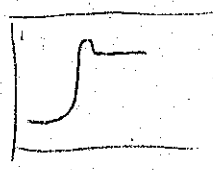
or "copy"

(11) "epenthetic": this, a more "standard" solution, would see the second half of the contour as the result of a rule of feature copying and adjustment. The facts of (3) -- where the verb is regular in tone -- would be described as in (8), or in different and more perspicuous notation (9). (Admittedly, (9) looks more like autosegmental representation, but this is intended to represent the --the type of rule posited by those who countenance segmentation of the segment -- the bulk of those working on African tone languages.

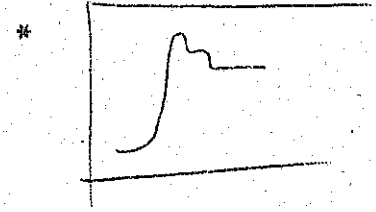


To account for the facts in (7) -- reproduced schematically in (10a) -- the epenthetic solution must do something like (11), which, when collapsed with (8) or (9), yields (12). That is, crucially, it must turn the Mid on wu into a H, or else it will derive a form like (10b).

(10a) ^X Adha wu...



*(10b) Adha wu ...



$$(11a) \begin{bmatrix} V \\ +hi \end{bmatrix} NP \begin{bmatrix} VP \\ C \begin{bmatrix} V \\ -lo \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} V \\ [+hi] \begin{bmatrix} -hi \\ -lo \end{bmatrix} \end{bmatrix} NP \begin{bmatrix} VP \\ C \begin{bmatrix} V \\ +hi \end{bmatrix} \end{bmatrix}$$

Or, equivalently, (11b)

$$(11b) \begin{array}{c} V \\ | \\ NP \\ [+hi] \end{array} \begin{array}{c} C V \\ | \\ [-lo] \end{array} \rightarrow \begin{array}{c} V \\ | \\ [+hi] \end{array} \begin{array}{c} C V \\ | \\ [-hi] \\ [-lo] \end{array} \begin{array}{c} C V \\ | \\ [+hi] \end{array}$$

(9) and (11), as we said, collapse to form (12)

$$(12) \begin{array}{c} C V \\ | \\ H \end{array} \begin{array}{c} C V \\ | \\ [\alpha lo] \end{array} \rightarrow \begin{array}{c} C V \\ | \\ H \end{array} \begin{array}{c} C V \\ | \\ [-hi] \\ [\alpha lo] \end{array} \begin{array}{c} C V \\ | \\ [-hi] \\ [\alpha lo] \end{array}$$

I repeat that although some of the notation above looks like autosegmental representation, this is only for the convenience of reading: these "solutions" are not what I am referring to as the autosegmental solution, which is, rather,:

(iii) The third solution is the autosegmental rule, whose application could be seen in (7) above. A rough statement of the rule -- call it the I Main Flop Rule is (13).

$$(13) \begin{array}{c} V \\ | \\ H \end{array} \begin{array}{c} VP \\ | \\ T \end{array} \begin{array}{c} CV \\ | \\ T \end{array} \rightarrow \begin{array}{c} V \\ | \\ H \end{array} \begin{array}{c} CV \\ | \\ T \end{array}$$

or rather

$$\begin{array}{c} V \\ | \\ H \end{array} \begin{array}{c} CV \\ | \\ T \end{array}$$

where the dotted line, as elsewhere, indicates a structural change: addition.

We have yet, however, to make clear the sense in which a comparison of rules (12) and (13) provides an argument for autosegmental theory. -- to which we proceed.

2.3 Towards an evaluation metric

We are in a position, now, to see the autosegmental analysis as a step toward a solution of the projection problem -- that is, as a method for evaluating what a "true" linguistic generalization is. In this sense, autosegmental theory is an empirical hypothesis regarding the generalizations a language-learner will in fact make, and thus what may constitute a genuine synchronic rule.

Let us thus consider one evaluation metric consistent with (though assuredly not the only conceivable evaluation metric consonant with) autosegmental theory.

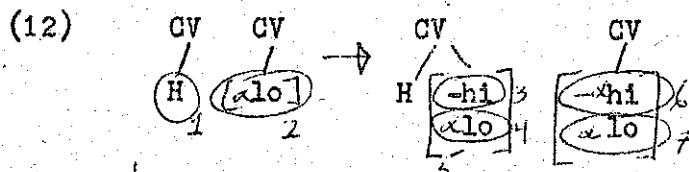
Proposal I: Evaluation metric:

1. All rules per se are equally valued: that is, it is no more or less costly to effect a generalization in the lexicon (morphologically) than in the derivation (phonological-phonological-autosegmental rule).
2. In the statement of a rule, boundary elements, major category names, (syntactic: N, A, V, N^I, ..., or phonological: C, V, T) and association lines are not counted as "costly"; all other features are counted on an equal par: one feature, one cost unit (FN)

FN: This is essentially the familiar proposal of (?Halle?). Parenthetically, it is surely wrong to say as I do that these boundary elements are completely costless; that has extremely bad consequences. In fact, what we would want to say is that they are costly but much less costly than feature specifications: say, then, that boundary elements and association lines cost 1/100 unit).

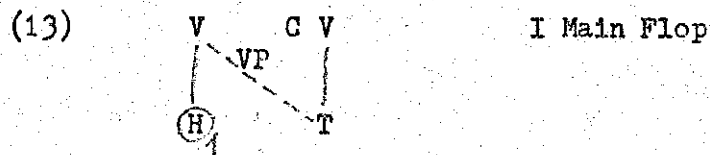
3. The epenthesis of a segment counts as 1 unit above and beyond the features required in the statement of the rule.
4. Elements left unchanged by a (transformational) rule are not counted twice (i.e., once in the structural description, once in the structural change), but only once.

On the basis of this proposal, we may evaluate the "epenthetic" solution and the autosegmental. As formalized in (12), the first is evaluated as 7:



I have circled each element contributing to the complexity, according to the proposed evaluation metric.

The autosegmental rule (13) (inaccurate here only regarding boundary elements, which ex hypothesi do not contribute to complexity) costs only 1.



Evidently, the autosegmental rule is the "preferred" one, according to the evaluation metric.^{FN}

FN: It should not be necessary to add that this, per se, is of entirely no interest without empirical support for the evaluation metric. On the other hand, the EM is not wild: on the contrary, it departs very mildly from the EM essentially assumed in conventional phonological literature. To the extent that it thereby "inherits" empirical support, the EM above is motivated already.

2. § Towards Empirical Justification

The notion of "empirical justification" that we must approach now is Janus-faced, like all scientific procedures. We justify a theory only in relation to other "conceivable" theories, and all "empirical justification" is justification of one theory vis-a-vis other theories with facts bringing us to our choice of the theory.

We must compare, then, the autosegmental analysis in general against a fair representative of the best alternative theories we can find -- this is the only kind of justification that there can be inside linguistics.

And the "fundamental question of linguistics" comes down to: when a language learner learns something, what specifically does it learn? In any given case, does it learn one "word", one "form"? Does it achieve a generalization? If so, in what component of its mental resources? What kinds of generalization is each component capable of, and what generalizations are linguistically favored -- that is, what generalizations will constitute the first choice of the language-learner in accommodating new, recalcitrant linguistic forms (data)?

A linguistic theory is an attempt to answer these questions.

The method we shall use to test empirically two theories about the generalizations made by a language-acquirer will be this^{FN}:

FN: In any event, this entire section is no more and no less than a quantification (of my understanding) of (Chomsky's notion of) generative grammar.

with a given amount of empirical data D , each theory T_1 will have a range of solutions (S_1) -- partial grammars, we might say. Each solution is claimed by the theory to be part of a possible human language. We don't have access, however, to a large number of relevant human languages -- generally just one, or occasionally, if we are lucky, two or three related dialects or diachronic stages which agree concerning data D but diverge on closely related questions.

Each theory will provide, with each solution, a measure of complexity. Two theories may agree largely on what are "possible" solutions while sharply disagreeing on what is the complexity of each. Or again, virtually any solution countenanced with "standard" generative phonology is countenanced within an autosegmental theory; however, non-autosegmental solutions are often (as we saw above) evaluated as much more complex than autosegmental solutions.

The logic of our procedure is as follows: for a given set of data D_A , theory T_1 permits a class of solutions S_A^1 , each with a complexity assigned to it (we denote the complexity of solution $s \in S_A^1$ by $c(s)$, an integer).

Now, given a larger set of data $D_B \supset D_A$, we consider the set of solutions each theory permits: S_B^1 permitted by theory T_1 . If $A \subseteq B$, then $S_A^1 \subseteq S_B^1$, evidently. Consider the complexity k_B^1 of the least complex solution in S_B^1 (i.e., $\min(c(s_j))$ where $s_j \in S_B^1$).^{FN} It doesn't matter if there is more than

FN: This would be the complexity of the solution theory B claims the learner chooses on the basis of this data of course. These definitions, naturally, are to be generalized for any set of data -- "B" is free here.

one solution in S_B^1 with complexity k_B^1 .

Then define TEM (for theory-evaluation-metric) $TEM_{A,B}^1$ as the number of solutions in S_A^1 with complexity less than or equal to k_B^1 .^{FN}

FN: The clause "or equal" penalizes a theory for not ranking rules by complexity; if a theory says a class of solutions is of the same complexity -- giving therefore the language learner less head-start -- it is correspondingly penalized in calculating TEM.

*I'm having
a pretty
strong
aversion*

$TEM_{A,B}^1$ evaluates the relative desirability of each theory S^1 on the basis of the data sets D_A and D_B . The theory with the smallest $TEM_{A,B}^1$ is, on the basis of this data, the most preferred. It is the one which, in a real sense, most naturally accounts for linguistic generalizations.

When D_A is the data in (2) and D_B is D_A plus the facts sketched in (6), the autosegmental theory wins hands down. This can be seen as follows. If theory T_1 is standard phonology, enriched a bit to handle the facts of tone languages (ie. to account for contour tones), and T_2 autosegmental phonology, the least complex standard solution for D_B is (12) of complexity 7 (with the caveat discussed in FN on page 5). Therefore $k_B^1 = 7$.

Similarly, $k_B^2 = 1$, for the autosegmental solution is as in (13). Now we ask how many solutions are there within T_1 which satisfy D_A and are of complexity less than or equal to 7. This number is $TEM_{A,B}^1$. We return to the calculation of this number in a moment.

We ask the same question for the autosegmental theory: what is $TEM_{A,B}^2$? How many solutions for D_A (i.e., in S_A^2) are of complexity less than or equal to 1? We enumerate them:

(1) Rule (13) itself, obviously.

(2) A second solution -- in effect, morphological -- is conceivable.

At the present stage we do not know the relative complexity of a morphological rule providing a floating Low tone to the left of the verb stem, which would "dock" onto the subject, a solution which would suffice to cover the data D_A .

To make the worst assumption for the autosegmental theory, let us assume that the complexity of such a solution is less than or equal to 1.

Not that any epenthesis of a Low-tone will be of complexity greater than 1, by the proposed evaluation metric (in fact, it will be of complexity 3 at least).

Thus we may conclude $TEM_{A,B}^2 = 2$.

We return to calculating $TEM_{A,B}^1$. We bear in mind that the more it is larger than $TEM_{A,B}^2$, the more is the autosegmental theory empirically supported.^{FN}

^{FN} Now there's a sentence for Joan Bresnan. No one with $IQ < 200$ could understand it.

Thus we must determine the members of S_A^1 whose complexity is less than or equal to 7. A complete calculation is not worth the effort, actually.

A moment's calculation shows the following.

If we consider the class of solutions in S_A^1 which do not contain any α s on the features and which involve in the structural description and structural change only the segments mentioned in (12) -- that is, a very restricted subclass -- we quickly find over 40 solutions:-- ~~xxxxx~~ thus $TEM_{A,B}^1 \gg 40$. If we permit the inclusion of α -notation, necessary for the statement of the rule, the possibilities rise into the hundreds. Thus $TEM_{A,B}^1 \gg TEM_{A,B}^2$ and the autosegmental theory is strongly supported.^{FN}

$a^x - b = z$; donc Dieu existe. Répondez!

Bm, sagte der Graf dann a sprach
perfekt Französisch

2.6 Extending the data We consider another example. Consider other data relevant to the choice between a rule like (12) or (13), and thus relevant to the choice between theories. That is, D_B is as before; D_C is D_B plus the data below in (14). We shall test the theories T_1 and T_2 by comparing

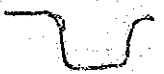
theories T_1 and T_2 by comparing $TEM_{B,C}^1$ and $TEM_{B,C}^2$.

Recall that the substance of rule (13) is that, in effect, the second tone of the falling tone on the final syllable of the subject is the same toneme as the toneme on the verb stem. Implied by this claim is that if the tone of the verb stem is modified during the derivation, then the final syllable of the subject should change, too.

Such cases exist. The pronoun anyi ("us"), when an object, raises the tone of the preceding syllable to M (mid). Consider following paradigm:

(14) D_C :

oyi jã m "I am feverish"
"Fever holds me"



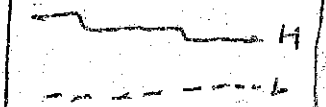
oyi ji gi "you"




oyi ji ya "... him"




Oyi ji anyi



Oyi ji unu



Oyi ji ha



"... us"

"... you (pl)"

"... them"

Let us hold in abeyance the question of how the object anyi manages to raise the stem from L to M, and let us say that both theories T_1 and T_2 have essentially the same mechanism for this, a rule R of complexity N, let us say. Then given rule R, the autosegmental theory T_2 permits only one solution of minimal complexity $N+1$ for D_C : $TEM_{B,C}^2$ is 1, therefore. There is no question of rule ordering, because both orderings of rule R with respect to the autosegmental rule are completely

equivalent.

Given the standard theory, however, either ordering is possible; that is, there are two solutions of complexity $7+N$ in S_C^1 . Thus, $TEM_{B,C}^1$ is 2. Again, $TEM_{B,C}^1 > TEM_{B,C}^2$, and autosegmental theory is supported.

What we see here, of course, is a failure on the part of the standard theory T_1 to predict a rule ordering. Note that neither ordering is bleeding and that both orderings are feeding ((The correct solution is the less opaque relationship, in Kiparsky's sense)). This is generally so in Autoseg. stuff, as no let available,

2.6 Suffixes: There is another argument regarding Class II suffixes, an argument of the same form as that in section 2.5. Since we have not considered suffixes yet, the details must be tentative; nonetheless, the general form is clear enough.

Suffixes divide into two classes: I and II. It is clear that the Class I is by far the most numerous, and the normal or unmarked form. These suffixes are toneless, ^{as} originally noted and argued for by Edwin Williams. They receive their tone "vicariously", by the spreading of tones not associated with them underlying.

Thus the normal I Main form followed only by Class I suffixes induces a Low tone on all the suffixes, e.g. (15).

(15). ɔ̃ zùrù jɪ "he bought himself yams"

Class II suffixes, however, are themselves always Low, and impose a High tone on the preceding syllable. We will ultimately attribute this to a left-end floating H-tone on the Class II suffixes as in (16); for now, the particular explanation need not be defended.

(16) #ri
H # L

We find ~~examples~~ examples like (17).

(17) 6 kwururi okwu a "he made this statement"

Cl. I Cl. II
stem af af
kwu + ru # ri #
L + H # L #
stem affix

(I Main form)

If there were no class I suffix between the stem and the Class II suffix ~~we~~ (no "ru" as in (17)) we know what to expect: the floating H tone should *dock* onto the L-tone stem, causing it to become LH, later becoming M exactly as with the floating H from anyi as in section 2.5. This prediction is correct: see (18).

(18) ha diri

ha # di # ri #
H # L H # L

Underlyingly

ha # di # ri #
H # L H # L

I Main Rule

ha # di # ri #
H # M # L

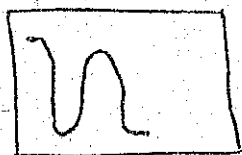
LH → M

LH → M

should be
2 #s between
ha and di
→

Again, if this were not treated autosegmentally, there would be two possible solutions: the correct one, and the one where the originally Low tone stem lowered the subject first, and then the stem is raised to Mid, giving (*19).

(*19) [~]ha di ri



2.7 One last remark on the functioning of the I Main Rule. Note examples like (20).

(20) [_N Ndi [_S no n'ahya]] [_N na emé ụzụ.] (p.85)
 "people[who are/were in the market]
 were making a noise."

The presence of a long or "heavy" subject -- with another syntactic cycle inside of it -- does not affect the operation of the tonological I Main rule. I mention this to contrast it with the similar form in English which doesn't work quite the same way: the parallel, that is, is between the lowering of the tone at the end of the sentence's subject phrase in Igbo, and the POSS at the end of the subject of the noun phrase in English (21).

(21). the city's reconstruction

the delegates' instructions

(22) [[_N the city [_S destr ^yed by the ^{missile}]] POSS] reconstruction

*the city destroyed by the ^{missile} 's reconstruction

*the delegate to the conference's instructions

Any universal theory attempting to explain the ill-formedness or uninterpretability of (22) must cope with the fact that forms as in (20) are fine in Igbo.

I quit!

3.1 I subordinate (Green and Igwe's "I subordinate conditional")

This form appears only in subordinate clauses, introduced by an element ka or ma. The tone of the subject is unaffected^{FN} in this form.

FN: More accurately, the last rule that affects the tone of the subject NP contains in its domain of application nothing outside of that NP, and undergoes no changes specific to this form.

The tone of the verb stem depends on the underlying tone of the verb.

An underlying Low verb will be Low; an underlying non-Low verb will be High.

I shall denote this general occurrence in tone formulas as "B", where "B" stands for "Base", or the underlying tone of the stem. Thus we may say that the tone of the stem is B in the I Subordinate form.

(23) Low-verb: Anyí fée unú unú adu anyí "if we pass you, you'll follow us" (p. 81)

(24) High verb: Anyí círí akhu ndí gwe ya ga íjidhé anyí
 stem ——— ↑ 'if we pick up kernels, the owners will arrest us' (p. 79)

3.2 Digression on suffixes:

The tonal behavior of suffixes in this form is revealing. We briefly touched on the subject of suffixes above (section 2.7), where it was observed (following Green and Igwe) that there are two classes of suffixes, the more common being Class I. We shall consider verb forms with just Class I suffixes for the moment.

We observed in section 2. that in the non-exceptional I Main forms, Class I suffixes are realized on a Low tone. In the I Subordinate form, the Class I suffixes are uniformly High in tone, whether the stem is itself High or Low.

The autosegmental framework, as developed to this point, suggests as the underlying forms possible for Class I suffixes any of the representations in (25).

- (25) (i) +CV (ii) +CV (iii) +CV (i.e., toneless)
 L H

The standard theory, of course, permits underlying forms corresponding to (25i and ii), but not one corresponding to (25iii). For the present, I shall simply posit (25iii) as the correct underlying form for the Class I suffixes, and leave the ultimate argument that results from this for autosegmental theory aside until we have seen more of the Igbo tonal system.

The I Main form with Class I suffixes now looks at some point like (26), and the I Subordinate as in (27); the dotted line represents associations to the Class I suffixes added by the Well-formedness Condition.

- (26) o citara nkhu p.77 'She picked up firewood'
 H L H H I Main Form

- (27) o gbatula nkwa 'When she danced,...' p.56
 H H H H High verb: I Subordinate form

- (28) Ekwe kee akwaha ... 'If Ekwe shares out eggs,...' p.82
 H H LH M Low Verb I Subordinate

or

*when are
the suffixes*

ma	a	kaala	nka	abuo
L	H	LH	H L	L HM

also Low verb I Subordinate

p.83

We shall thus ultimately say that this form is characterized by an (obligatory) H suffixal ('floating') tone, following William's analysis. ^{FN}

FN : It is important to be aware that the floating suffixal H is in no sense "abstract". An element is abstract to the extent that it is used to trigger rules but it itself does not show up on the surface. The H-tone is not of this character. In virtually all cases it in fact appears on the surface, unchanged from its underlying form. Only in the rare case of a suffix-less verb followed by a direct object beginning with a H-tone is the H deleted (see below). In all other cases it is realized on the surface.

The fact that it is a specification only for tone -- laryngeal activity -- is totally irrelevant to the abstractness controversy. By such a criterion, all vowels in English, e.g., would be abstract, since they are not lexically specified for tone, and thus contain "only" specification for oral (and perhaps velar) articulation.

3.3 Object Mutation: We observe that nouns that immediately follow the verb in the I Subordinate Form -- generally the direct object, but possibly the indirect object -- undergo a tonal shift or mutation, sketched in (29).

(29) Tone before Object Mutation

Tone after Obj Mutation

H	M
HH	HM
LH	MH
HL	HL
LL	LL

Observing this phenomenon of Object Mutation, we have essentially two questions to ask, questions which we shall deal with separately. First we may ask what is the immediate process being described; second, what triggers it? -- that is, what is the proper environment for such a process?

The data to be explained under the first question are in (29). Most nouns in Igbo are bisyllabic; all monosyllabic nouns are H. In (29), then, we are dealing with all but the infrequent nouns of more than two syllables.

We note first that three forms undergo some change; two undergo none -- the two which end in L tone. We might make a simple stab at a rule like (30), ignoring the triggering condition.

(30) $H \rightarrow M / \text{---} \# \#$

more precisely,
or $T \rightarrow [-hi] / \text{---} \# \#$

Such a simple rule is of cost 1 (one feature, "-hi"); it is literally as simple as a rule can be. We observe it is empirically satisfactory for four of the five forms: it expresses the fact that forms ending in $L[-hi, +lc]$ undergo no change; it also correctly states the change undergone by the forms H and HH. It wrongly predicts, however, that LH will become LM. Recall, too, that LM is superficially indistinguishable from LH: thus (30) as written predicts a "systematic" change for the LH forms, but with no distinguishable surface realization of that change. As (29) shows, however, the actual result is "MH".

Looking at the surface description "MH", we remark that this pattern may reflect either of two structures, (31) or (32), in the autosegmental framework.

(31)

CV CV
| |
M H

(32)

CV CV
 \
 M

As noted above, rule (30) applied to the LH forms gives (33), which,

obviously, is neither (31) nor (32).

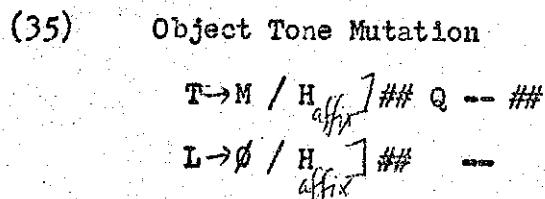


If the effect of rule (30) is augmented by a rule deleting the L in (33) -- thus, in effect, permitting (30)'s change of the H to M to be heard on the surface, no longer masked by the L -- then (32) results. Thus the simplest autosegmental solution for the data presented is rule (30) plus rule (34).



Note that the other place where (34) operates -- i.e., the LL forms -- its apparent effects are not noticeable. The remaining L spreads over both syllables. Again, rule (34) is of cost 1, just like rule (30).

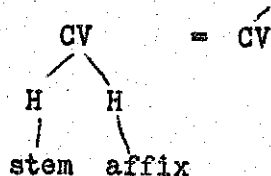
What, now, is it that triggers these tonal mutations? Following Williams' analysis, it is the floating H-tone mentioned in #3.2 above. As a rough approximation, then, we have Object Tone Mutation (35).



3.4 If we posit a floating H affix in this, the I Subordinate form, we would predict the following structures in the case, not yet observed, where there are no verbal suffixes:

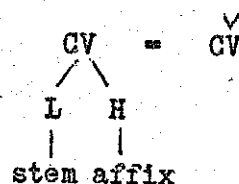
(36) H-verbs

(a)



L-verbs

(b)



Thus the verb stem should not be L when there are no suffixes, according to

the theory, and ^{the} data examined to this point.

In fact, (36) is correct: H verbs without suffixes are unexceptionally H. The L-toned verbs display the following tonal behavior:

- (37) $\begin{array}{l} \text{ányí kẹ́ ǎnú} \\ \text{ányí kẹ́ ǎkwá} \\ \text{ányí kẹ́ ǎzú} \\ \text{ányí kẹ́ ǎlá} \end{array} \left\{ \begin{array}{l} \text{'ó gá ifu úká} \\ \text{ } \\ \text{ } \\ \text{ } \end{array} \right. \begin{array}{l} \text{(a)} \\ \text{(b)} \\ \text{(c)} \\ \text{(d)} \end{array}$ p. 79

where (37) displays the verb's tone before underlying HH, LH, HL, and LL nouns, respectively (the "Canonical order"; they have, obviously, undergone object tone mutation in (37)). In (a) and (c), however -- that is, before a H-tone -- the verb displays its normal L-tone. In (b) and (d), rather than the contour tone indicated by (36b), we find a M tone.

We note immediately that M and $\widehat{\text{LH}}$ are nowhere contrastive in Igbo; in fact, we shall see, most M tones derive from a structure as in (37) -- that is, $\widehat{\text{LH}}$. The (b) and (d) examples, then, are encouraging: for they as directly as possible indicate the reality of the posited H tone.

To account for (37a) and (37c), therefore, we must invoke a simplification rule, whose point of application will be of interest after seeing further data.

(38) Floating-H Deletion

$$\begin{array}{c} \wedge \\ \text{T} \cdot \text{H} \cdot \# \cdot \# \cdot \text{H} \\ 1 \quad 2 \quad 3 \\ 1 \quad \emptyset \quad 3 \end{array}$$

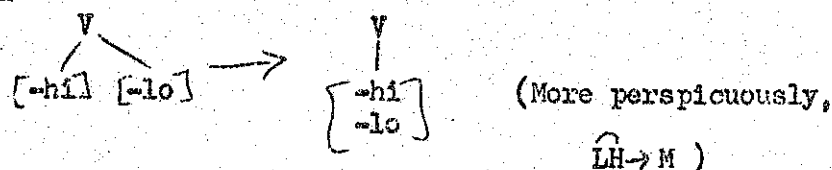
(38) Floating-H Deletion says that a contour tone followed by an H is simplified as shown above. Note, crucially, such an H-deletion does not occur in examples such as (28), where the H tone is associated to its "own" syllable (s). Floating-H Deletion ^{would} bleed Object Mutation, but applies after it, in counter-bleeding order; [this should be predictable on independent grounds since Floating-H deletion is a neutralization rule (since all deletion rules are neutralizations).]

If you believe this mythology.

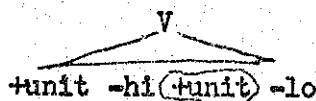
+V -hi +V -lo

Finally we have also LH Simplification (39).

(39) LH Simplification



(Maudit en tabarnac! this can be written:



It's enough to give one pause...)

in MH's notation

I love that
but it can't
write —
Only by metathesis
can you do it!

4.1 I Relative A

because +V -hi -V -lo \Rightarrow
+V -hi

The term "Relative A" indicates that this form -- used for relative clauses -- is for relative clauses where the head of the clause is the subject of the embedded sentence, as in "the woman who won the prize," but not as in "the man I saw." The latter would be treated as a Relative B form.

The tone of the verb stem in this form is invariably M, while the suffixes are H, caused by a floating H tone triggering, as we would now expect, object mutation.

Examples: (40)

* Low-Verb: $\dot{n}di \quad n\dot{g} \quad \dot{n}i\dot{h}y\dot{a} \dots$ 'the people at the market...'

high verb: $\dot{i}g\dot{b}\dot{o} \quad r\dot{i}r\dot{i} \quad j\dot{i} \dots$ 'the Igbo people who eat yams...'

* What is peculiar is that while Green & Igwe assert that Low-verbs have Mid-tone stem, their few examples of Low verbs here are all without suffix. The present analysis, therefore, is consistent (given the limited data) with the tonal formula $H B^* H$, rather than $H M H$ (see p. 23). However, comparison with the I Rel A (see Section II below) supports G&I's assertion that the melody is $H M H$.

However, a new tonal phenomenon arises in this form. The tone of the final syllable of the subject of the clause is raised, as we see above in (40). In brief, the change undergone is as follows:

(41) Underlying	Subject Mutated Form
jí H	jí H
ánu HH	ánu HH
ákwhá LH	ákwhá LH
ònú LL	ònú L LH or ònú LH
ázu HL	ázu HM

We see clearly what is going on if we look at the change $\text{ònú} \rightarrow \text{ònú}$: an H-tone is being added on. As for the L LH / L H alternation, we have already posited (39) LH simplification, which will change L LH to LH, which is itself indistinguishable from LH. This same rule explains the HL \rightarrow H LH \rightarrow HM change (the last line of (41)). In fact, we are rather pleased to see surface alternations justifying rule (39). That the forms ending in H don't change tonally follows, of course, if we accept this analysis of tone-raising as resulting from a leftward docking of a floating H-tone, since $\begin{array}{c} V \\ \swarrow \searrow \\ H \quad H \end{array}$ is indistinguishable from $\begin{array}{c} V \\ | \\ H \end{array}$.

If we step back from the analysis a moment, we may note that tonal alternations like those displayed in (41) are exactly the sort predicted by a theory with floating tones: unidirectional (raising, lowering) tonal changes on the left or right side of a word, sometimes realized by contour tones themselves. In addition, we would expect a systematically motivated syntactic or morphological origin for the floating tone. (On this last point, see 9.2 below.)

In summary, then, the I Relative A form is:

<u>Floating</u>	<u>Stem</u>	<u>Suffixal</u>
H	M	H

??

5.1 I Relative B

Roughly speaking, this form is used for relative clauses where the head of the relative clause is not also the subject of the relative clause -- "roughly", because we find cases where the I Relative B is used where there is no particular head at all; rather it is used as an adverbial clause. We shall consider these below. There are no cases, however, where the I Rel B is used as a relative clause where the head of the relative is the subject of the relative clause; in all such cases, the Relative A form is used. Conversely, I know of no cases where the Relative A is used as an adverbial.

The tone of the verb stem in the I relative B form is always L. The suffixes follow on L tone, too, indicating that there is no suffixal tone in this tense. As we expect, then, there is no object tone mutation in this tense, either.

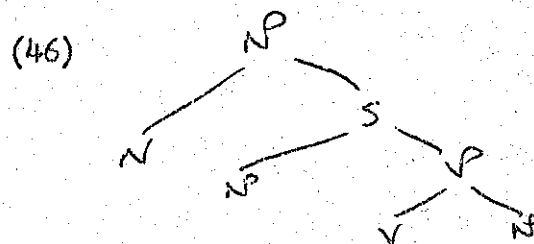
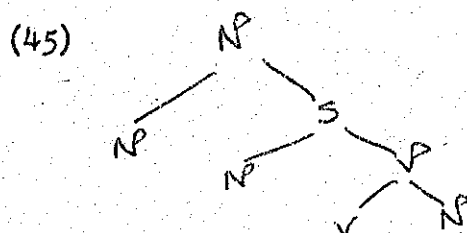
Just as we found Subject Tone Mutation in the I Relative A form, we find such a tone mutation here in the I relative B form. Some examples:

(42)	<u>Underlying</u>	<u>Mutated form</u>
	H fí	H fí
	L H ùbhé	L H ùbhé
	H H éghú	H H éghú
{	H L úkhwà	H M úkhwà
	H L Ládha	H LH Ládha (personal name)
	L L òvù	L H (=LM) òvù

In the examples in (41), the form with surface alternations was LL.

Here, in the texts, we find occasional alternations with the HL form, as indicated above. Considering the sparcity of data, I have no way

The syntactic structure to which this rule is applying is something like (45) or (46).



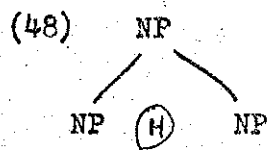
We shall formulate the Disjoint Tonal Sandhi Rule, but this is tentative (and based on some applications we have not yet come to).

(47) $H \rightarrow L / \text{--- } X \# \left[\begin{smallmatrix} \text{---} \\ S \end{smallmatrix} \right] \# L$ Condition: X contains no # and no H.

Three remarks: first, surely this is wrong.

second, note that this produces the correct results according to (44).

third, this rule would not apply to genitive constructions, as in (48) below, because there is no S-boundary in the genitive construction.



In summary, then, the tone form of the I Relative B is:

Floating Stem Suffixal

H L \emptyset

As mentioned above, there are also uses of the I Relative B without a head, but rather preceded by the complementizer "ka" which appears, as usual, with a L tone.

ex: Ahuru m unu ka unu vusi nghughwu n'isi.

"I say you as you were carrying parcels on year head."

5.3 The syntax of relatives in Igbo

To briefly touch on another question we shall return to: is there

any reason to posit a transformational source for relative clauses in Igbo? In particular, is there reason to suppose that the structure underlying an Igbo relative clause is syntactically "complete" in the sense of having a lexically specified subject (and object, in the case of a transitive verb)? With such a structure, of course, we would then posit a syntactic transformation of either movement or deletion.

In fact, there is no motivation that I can find for such an analysis. While there is a relative clause complementizer which is optional ("na"; see 9.2 below), it is not at the head of the phrase (and thus even the name "complementizer" is a poor choice); but more relevant is the fact that there is no wh-word (henceforth, whord), such as "which" or "who" in English standing at the head of the clause, indicating, conceivably, that there had been a movement process. Relativization apparently goes down only into Subject and Object position, not, e.g., into a PP: na + NP .

A relative B clause will thus have, a Δ node for direct object; the relative A will have one for subject. Or, quite possibly, a better analysis for the relative A clause would be as only a VP; this might explain the fact that the relative B clause κ can be used as a subordinate conditional clause but not the relative A.

In any event, assuming Δ nodes for subject and object in the A and B case, we are led to the interpretive rule (49).

(49) Relative Clause interpretation

$$NP_1 \approx \Delta / NP_1 \quad Q \quad \Delta \quad \text{Condition: } Q \text{ contains } \left[\begin{smallmatrix} S \\ \end{smallmatrix} \right]$$

Rule (49), Relative Clause interpretation, thus says that such a is interpreted as coreferential with the first NP found scanning leftward which is not a clausemate. ((Relative B clauses are thus treated like Tough-movement sentences in English))

6.0 Summary

We considered four forms to this point: Green and Igwe's Affirmative I Main, I Subordinate, I Relatives A and B. Before completing the set of "I" forms -- with the I Question and Imperative -- we shall consider the corresponding "II" forms, which will give us a better idea of the structure~~xx~~ of the phrases we are investigating.

(50)

Form	Floating	Stem	Affix	Special Rules
I Main	--	L	--	I Main Flop
I Subordin	--	B	H	
I Rel A	H	M	H	
I Rel B	H	L	--	*

*This form is subject to the Disjoint Tone Sandhi rule, but this is not due to a special marking of any sort, but because the I Rel B fits the SD of the rule on independent grounds.

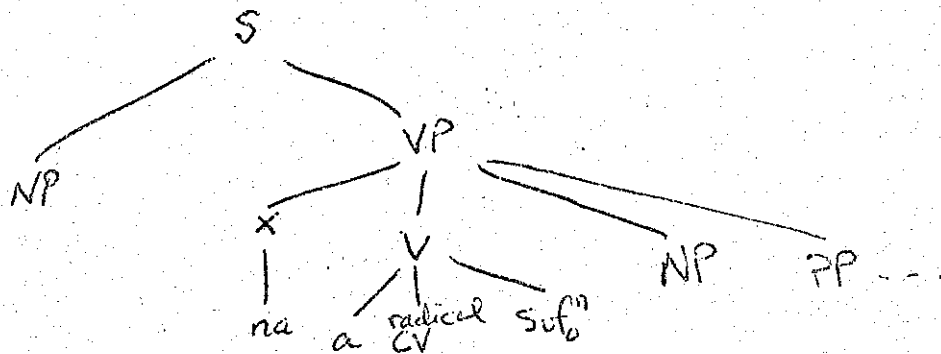
Remark that the only specially marked rule is one which applies only to "rwot" sentences, in Emonds' sense. We return to this below ().

7.0 The II Forms

The form of all the affirmative II forms is similar to the I forms except that there is a verbal prefix /a/, or /e/, depending on the harmony class of the verb. In addition, there may appear before the a/e a "relative marker" /na/ in the II Relative forms.

Thus, in short:

(51)



When one of the short forms of the singular pronouns -- or, as we shall say, one of the cliticizing pronouns -- is subject, the a/e prefix is suppressed -- unless the /na/ relative marker intervenes, in which case the a/e remains. On this important process, more below.

8.1 The II Main: initiating use.

This form, the II Main, is divided by Green and Igwe into (i) the initiating, and (ii) the non-initiating, form; by this is meant ⁽ⁱ⁾a discourse-initial use, or ⁽ⁱⁱ⁾elsewhere.

In the initiating use, the clitic pronouns are used. The following chart indicates the morphological shape of the pronouns throughout the forms:

(52) PRONOUNS:

Person	Singular	Plural
1	m/mu	-/anyi
2	i/gi	-/unu
3	o/ya	-/ha
indef	a/-	-/-

LEGEND:

(cliticizing form/
non-clitic form)

8.2 Prefix tone. Let us consider the tonal characteristics of this form when there is a non-cliticizing subject, thus not deleting the a/e prefix.

(53) High-toned verb ci 'carry' p.94

Egbe	acia	akhwa	Egbe carried eggs...
Adha	acia	akhwa	eggs...
Eze	acia	anu	meat
Ugho	acia	akpa	bags

(54) Low-toned verb za 'sweep'

Egbe	azaa	ama	Egbe swept the street
Adha	azaa	ama	
Uce	azaa	ama	
Ugho	azaa	ama	

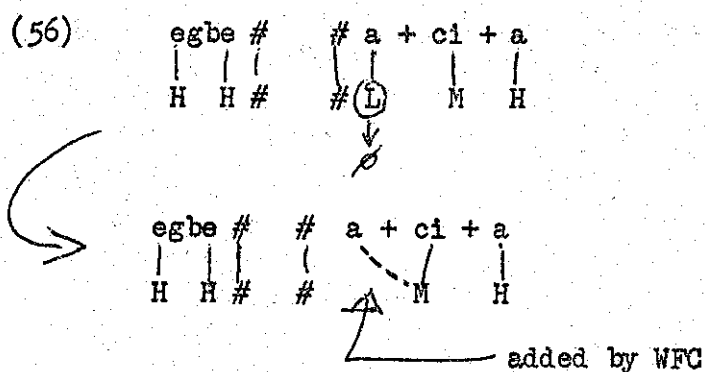
Apparently the final tone of the subject affects the tone of the prefix -- here, a -- for it changes, depending on whether the subject ends in H or L. We can summarize these tones in (55). I write "H/M" where we cannot determine which it is because a L precedes it.

(55)	Subject ends in:	H-verb		L-verb	
		Prefix	stem	prefix	stem
(a)	H	M	H	L	L
(b)	L	L	H/M	H/M	L

Note that the H following the M in (a), the H-verbs, is actually on the same pitch as the prefix which is indicated by M; in general, as we remarked in #3.3 above, (31) and (32) are phonetically indistinguishable. (p. 19 above)

But then we see that the prefix and the stem are on the same tone if and only if the subject ends in H; and that this tone on the prefix is found on the stem in the other case, when the subject ends in L.

In short, final H on the subject deletes the tone of the prefix, which automatically reassociates the stem tone to the prefix. For example:



The underlying tonal form, then, is what is given in (55b). The tone of the stem is L with a L-verb; and M with a non-L verb. I shall abbreviate this dependency by "B*" ("B" stands for base, or underlying, tone). This is meant in the following sense: there is a two-way underlying distinction

for verb tone. Those we call L-verbs are generally realized on a L-tone:

$\begin{bmatrix} -hi \\ +lo \end{bmatrix}$. The other class, the non-Low or High verbs, are generally realized either as $M = \begin{bmatrix} -hi \\ -lo \end{bmatrix}$ or $H = \begin{bmatrix} +hi \\ -lo \end{bmatrix}$. In either case, we see the underlying distinction determines the feature "lo"; the specification for "hi" is either simply "-", whence a M/L opposition; or the opposite sign -- i.e., $\begin{bmatrix} -hi \\ +lo \end{bmatrix}$ -- giving a H/L opposition.

The verb stem has tone B*, then, in the II Main. The prefix for non-Low verbs, as we can see in (55b) is L; the prefix tone for Low-verbs is either M or H, we cannot tell which. I shall arbitrarily pick H.* Thus the prefix has a dissimilatory tone on it with respect to the stem; I shall denote this as "B-".

(57) II Main

Underlying Verb Tone = B	Prefix = B-	Stem = B*
H	L	M
L	H	L

Let us make a preliminary formulation of the prefix-deletion rule illustrated in (56). Either (58) or (59) will suffice.

(58) $W \quad H \quad \left. \begin{array}{c} \text{NP} \end{array} \right] \cdot \left[\begin{array}{c} \text{affix} \end{array} \right] \quad T \quad X$ II MAIN RULE

1 2 3
1 \emptyset 3

(59) $W \quad H \cdot \left[\begin{array}{c} \text{affix} \end{array} \right] \quad T \cdot \left[\begin{array}{c} \text{verb} \end{array} \right] \quad X$

1 2 3
1 \emptyset 3

8.3 Cliticizing pronouns behave in the II Main as in (60): they are uniformly H in tone, be the verb H or L. The a/e prefix is suppressed.

(60a) $\begin{array}{l} \text{1} \quad \text{cia} \quad \text{anu} \quad \text{"you have carried meat"} \\ \text{0} \quad \text{cia} \quad \text{anu} \quad \text{"he ..."} \\ \text{a} \quad \text{cia} \quad \text{anu} \quad \text{"meat has been carried..."} \end{array}$

cl 'carry'

* Clearly nothing rides on this choice.

(62) L-verb zà 'sweep'

yá byá (a) zaa úlò 'when he comes home the house will be swept'

H-verb hú 'see'

Ébè à galà, (a) hú yá 'wherever one goes, one sees him'

Why should this be? I have no idea. Green and Igwe observe that the prefix a may be L sometimes when the subject is anyi or unu (that is, we or you (pl)).-- this may be related. With that possibility, we could hypothesize that the way the cliticizing pr subject pronoun deletes the a/e prefix is by being put "on top of it", as in (63).

(63) $\left[\begin{array}{c} \text{NP} \\ +\text{clitic} \end{array} \right] \left[\begin{array}{c} \text{verbal} \\ \text{affix} \end{array} \right] \quad \text{Subject Cliticization}$

$\begin{array}{c} 1 \\ \emptyset \end{array} \quad \begin{array}{c} 2 \rightarrow \\ 1 \end{array}$

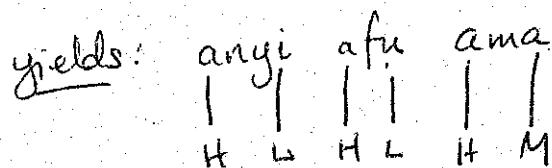
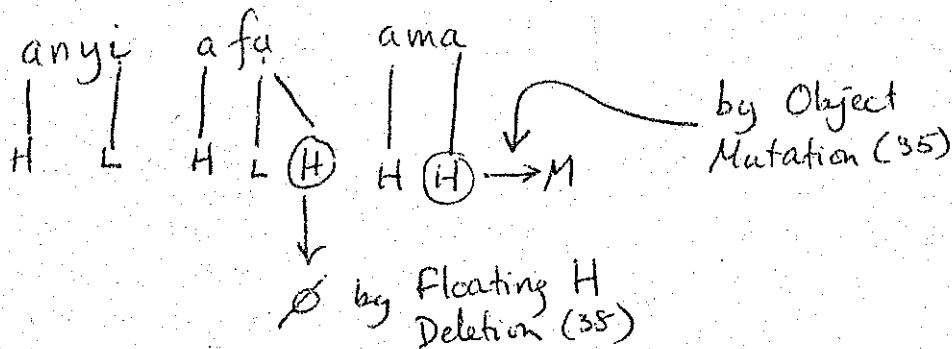
We might further distinguish the case where the subject's tone was displaced with it (initiating use, (60)) from the case where the displaced pronoun had the verbal affix' tone "grafted on". This remains speculative at best, however, at present.

8.5 By way of review, consider the following paradigm (64) (G&I, p.98) for the II Main. The superficially complex tonal alternations reveal themselves as quite natural, given what we have seen so far.

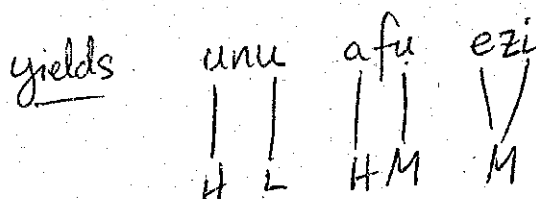
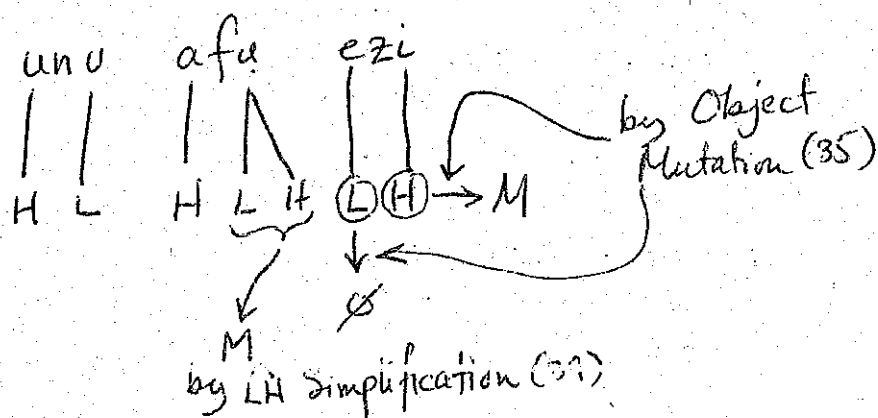
(64) (i) Yá jík'heré, \$ ányí afu amá. L-verb fù
 (ii) Àhú khówé, \$ unù afu ézi.
 (iii) Á bhá yá, \$ yá abha éde. L-verb bhà
 (iv) Á bhá yá, \$ yá abha alá.

In all four cases, the underlined verb -- prefix plus stem -- is in the II Main form, but due to different environments, each has a different tonal pattern.

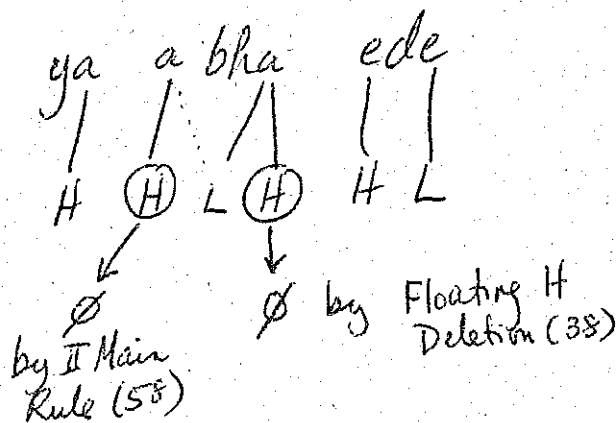
(64i)



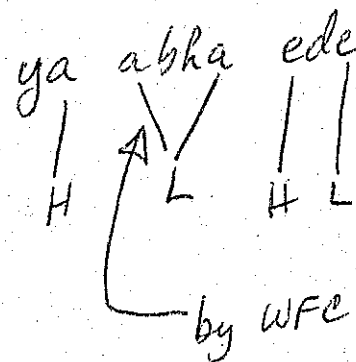
(64ii)



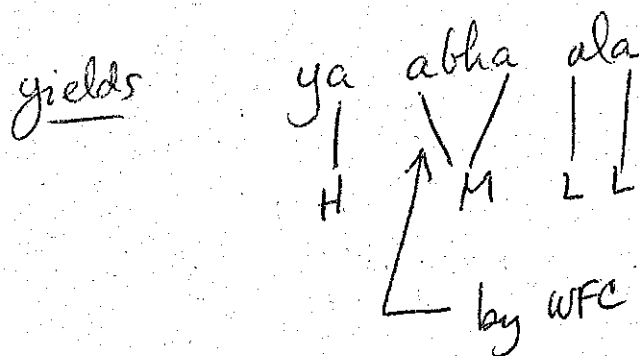
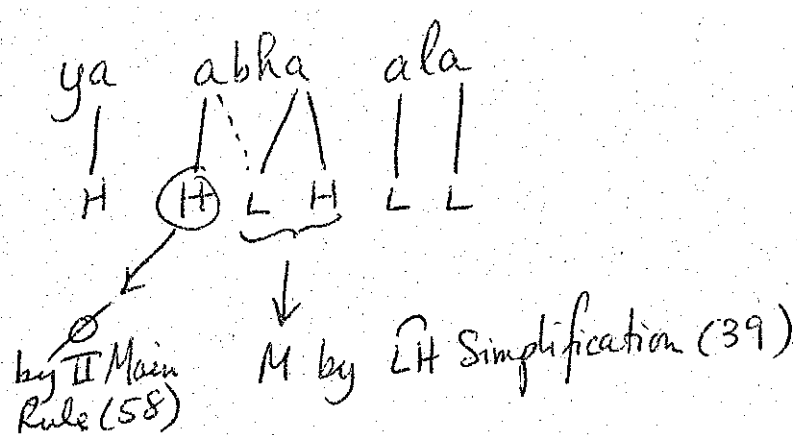
(64iii)



yields



64iv)



These derivations illustrate our rules:

- (35) Object Tone Mutation
- (38) Floating H deletion
- (39) LH Simplification
- (58) II Main Rule

We also have

- (13) I Main Flop
- (47) Disjoint Tonal Sandhi
- (63) Subject Cliticization

9.1 II Subordinate

This is, on first sight, a curious form tonally; but ultimately it will become quite reassuringly normal.

Its use is generally translated as "lest S..." -- This reflects some general general sense of the II Subordinate and II Relas A and B: non-real and negative. Typical translations include: "Go and tell him lest he leave the market" or "If people should happen to come, you know where to find me."

The direct object undergoes no tonal mutation; the verb is on a Low tone no matter what the underlying specification of the verb, and the toneless suffixes follow, predictably, with Low tone. The subject undergoes the same raising in final tone that was discussed in section 4.1 above ((41)): see (67) below. In short, given our analysis so far, we expect a tonal formula something like (66), bearing in mind we have not yet explained the origin of the left-end floating H-tone.

(66) Floating Stem Suffix

	H	L	Ø	
(67) # /aghú/	...ághú	ègbùò	éghú	...lest the leopard kill the goat...
# /óké/	...óké	àtàà	ákhú	...lest the rat eat the palm kernels...
# /úžé/	...úžé	àtàà	yá	...lest the squirrel eat them ...
# /enwò/	...enwò	àtàà	yá	...lest the monkey eat them...

(68) Pronoun subjects

... m̂ gbùò éghú	lexst I kill the goat
... í " "	lest you kill the goat
... ó " "	lest she kill the goat
... ê " "	lest the goat be killed
ányí ègbùò éghú	lest we kill the goat
únú ègbùò éghú	lest you (pl) kill the goat
há ègbùò éghú	lest they kill the goat

(68), clearly, is curious. Where is the falling tone of the subject pronoun coming from (^ = Falling tone)? Our only other encounter with such a falling tone was caused by the I Main Flop rule, and it applied precisely to every noun except the cliticizing pronouns. More importantly, we have in (66) posited a floating H tone between the subject and the verb; yet if there's any H tone appearing in (68) -- at least with the singular pronouns -- it is on the left of the subject, not the right. We also must make precise how the a prefix receives the L tone it does in (67), rather than -- conceivably -- docking the floating H tone.

Rather than answer any of these questions at this point, we shall proceed directly to the II Relative B form, where we hope to find the answers. After that we will resume with the II Relative A.

and 5.2, bottom of p.26

10.1 II Relative B. The reader will recall that above (section 5.1) we observed that there was some overlap in the use of the I Relative ^B and the I Subordinate: sometimes the I Relative B was used adverbially rather than as a relative clause. Nonetheless, a glance at chart (50) indicates a substantial difference between the two forms.

The parallel II forms -- i.e., the II Subordinate and the II Relative B -- bear an even closer affinity to each other. In fact, we shall conclude that they are identical tonologically underlyingly.

Again, the verb stem and its Class I (toneless) suffixes are L in the II Relative B, just as was seen in the I Subordinate. The non-clitic subjects undergo the same final raising noted in (41) and (67), attributed to a left-end floating H tone. Thus on the three major tonological dimensions we have defined for Igbo verb forms so far, the II Relative B is indistinguishable from the II Subordinate: both have the left-end floating H tone; neither have a suffigal H (thus not triggering Object Mutation); and both have L stem tone.

Furthermore, when the II Relative B is used as an adverbial, it can appear with the suffix mò -- which appears elsewhere in Igbo only in the II Subordinate form.

The two essential problems we were faced with concerning the II Subordinate form were: what is the underlying tone of the pronominal subjects? -- and what is the systematical origin of the H-floating tone? Both questions can be answered by investigating the II Relative B, proceeding with the hypothesis that the II Rel B is the same as the II Subordinate.

The cliticizing pronouns in the II Rel B ^{appear to be} L-toned, as (69) indicates.

(69) Mgbé m zùlè ánú, ... 'whenever I buy meat' p.105

i zùlè --- you ---

ò zùlè --- he ---

etc.

we might be led to venture that

And since the II Subordinate is the same as the II Rel B, the cliticizing pronouns are underlyingly L in the II Subordinate. *The situation is slightly more complex; however (See p 40 below).*

10.2 We turn our attention to the floating H tone. In relative clauses with the a-verbal prefix (the II Rel B is the first we have seen so far, but there are quite a few more to come) it is always possible (in fact, preferable) to have a /na/ affix in front of the a-prefix. Thus, for the II Rel B both (70i) and (70ii) are possible.

(70i) Áhýá | éghú náàlà écí
market goat leave yesterday

The market the goat should have left yesterday

(70ii) Áhýá éghú alá écí

The subject-cliticization rule (63), repeated here, is a local ('minor') rule, in Emonds' sense, and is inapplicable if the optional na intervenes, as written.

(63) Subject Cliticization

$$\left[\begin{smallmatrix} NP \\ +clitic \end{smallmatrix} \right] \cdot \left[\begin{smallmatrix} verbal \\ affix \end{smallmatrix} \right]$$

1 2 →
Ø 1

Thus we find derivations as in (71) if the na is not present; like (72) if it is present (cf (70)). For the moment I ignore tone.

(71) Mgbe o ~~a~~ zula anu
 (63)↑

↳ Mgbe o zula anu (70i)

(72) Mgbe o na a zula anu.

(63) not applicable

↳ Mgbe o na a zula anu = 70ii

Note that if Emonds' hypothesis concerning the nature of syntactic rules is, in substance, correct, (63)'s blockage in (72) is not an accident. (63) Subject-Cliticization, being neither root nor (apparently) structure preserving, must be local. The possible alternative (73), while it could apply to (72), is not local, since it introduces a third intervening term, and therefore, according to Emonds' hypothesis, would not be possible in a relative clause.

(73) Non-rule.

$\begin{bmatrix} NP \\ +clitic \end{bmatrix}$	(na)	$\begin{bmatrix} verbal \\ affix \end{bmatrix}$	*
1	2	3 →	
∅	2	1	

This is clearly an excellent prediction; a familiar transformational theory which does not incorporate Emonds' hypothesis makes, under normal assumptions, the claim that (73) is a simple generalization of (63), while Emonds' modification of the evaluation metric results in the claim that (73) is a very difficult -- in fact, impossible -- generalization of (63). Unfortunately we are investigating only one dialect with an optional na. The claim of the impossibility of (73) would be more firmly established with dialectal studies indicating that although

* or even $\begin{bmatrix} NP \\ +clitic \end{bmatrix} \times \begin{bmatrix} verbal \\ affix \end{bmatrix}$
 1 2 3 →
 ∅ 2 1

rules might change in minor ways between dialects, none generalized (63) to the apparently simple generalization (73).

Turning to na's tonal characteristics: na, when present, is always H; and, note well, when na is present, the Subject Raising we have observed, in (67) and elsewhere, does not occur. Cf. (74), for example.

(74)(i) Áhýá ʔsò náàlà écí The market the pepper should have left yesterday
vs. (ii) Áhýá ʔsò àlà écí "

Furthermore, when the na is present -- thus blocking (63), Subject Cliticization -- the clitic pronouns are H rather than L. Compare, e.g., (69), repeated below, and (75), the parallel from with na appearing on the surface.

(69) Mgbé í zùlà ánú

(75) Mgbé í náàkààlà (Since you've spoken; p. 109, GI)

(We shall return to the related change on mgbé).

The origin of the floating H tone is now clear. It is syntactically parallel to the na-prefix. The na, however, is optional, while the H is not. When the na appears, the H and it are associated; otherwise, the H goes elsewhere to associate. This simple observation leads to the interesting conclusion that while the presence of na blocked rule (63), the presence of the intervening tonal segment H does not; again, evidence, if more was needed, that the string -- the concatenation -- of elements that is factored by a transformation does not contain tonal segments, for tonal segments compose a separate string.

In (51) above I indicated that na was dominated by VP rather than V (or anything else). There is no direct evidence that I am aware of to determine its actual position in the sentence. I shall maintain the structure as in (51) because further suggestions work well with this structure. Should further research indicate a different structure, of course, the details would be accordingly modified.

In sketching the structure of trees with significantly different tonological and phonological elements, I shall indicate two trees whose "leaves" are joined by association lines. As far as I am aware, such a notation makes no empirical claims beyond those made by the autosegmental system itself.

Thus the deep structure for (74) is essentially (76).

(76)

