AN ALTERNATIVE TO LEXICAL INSERTION FOR YORUBA COMPLEX NOMNS*

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In the standard theory of transformational generative grammar lexical insertion takes place in phrase structure before any transformational rules apply. In Yoruba, complex nouns can be formed very productively by processes which frequently involve application of well-accepted syntactic transformations. Since these noun forming processes are infinitely productive, nouns so-formed cannot all be entered in the lexicon. It is proposed that one of the rewrites of NP include noun complexes (Nc), i.e. syntactic structures to which transformations apply, followed by a non-transformational process of "amalgamation" which turns the derived structure into a noun. This proposal preserves the essential claims of the standard theory and avoids the pitfalls of lexical decomposition proposals.

1. Introduction

The standard theory of transformational grammar demands that all lexical insertion takes place in a block in the syntactic deep structure, and before any syntactic transformation operates. This requirement raises some problems in Yoruba syntactic structure. In Yoruba, some word derivation prefixes can be used to derive single words from almost any verb phrase regardless of the complexity of its internal structure. At least, one of these prefixes derives nouns from almost all possible verb phrases. Since most of the verb phrases used as stems for noun derivation are obtainable only after the operation of true syntactic transformations like deletion, adjunction and replacement for reflexivization, relativization, etc., it is difficult to decide on how to place the prefixes. Should they operate for noun derivation

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only in the deep structure before all true syntactic transformations apply, thereby excluding the possibility of lexical insertion for an infinite number of derived nouns, or are there alternative proposals?

Chomsky's statements on what the standard theory is, on what a lexical transformation is, and the requirement that lexical insertion take place in a block before any true syntactic transformation operates are now respectively stated as (1), (2), and (3):

(1) "A standard theory specifies, for each sentence, a syntactic structure \( \Sigma = (P_1, \ldots, P_i \ldots, P_n) \) (where \( P_i \) is the deep, and \( P_n \) the surface structure), a semantic representation \( S \), and a phonetic representation \( P \). It asserts furthermore that \( S \) is determined by \( P_i \) and \( P \) by \( P_n \) under the rules of semantic and phonological interpretation, respectively. More generally, the theory is 'syntactically based' in the sense that it assumes the sound-meaning relation \((P, S)\) to be determined by \( \Sigma \)."

Chomsky [1971:185]

(2) "A lexical transformation associated with the lexical item I maps a phrase-marker \( P \) containing a substructure \( Z \) into a phrase-marker \( P' \) formed by replacing \( Q \) by I."

Chomsky [1971:184]

(3) "Given \((P_1 \ldots, P_n)\) in \( K \), there is an \( i \) such that for \( j < i \), the transformation used to form \( P_{j+1} \) from \( P_j \) is lexical, and for \( j \geq i \), the transformation used to form \( P_{j+1} \) from \( P_j \) is nonlexical."

Chomsky [1971:184]

What we state as (1) is generally known as a standard theory or the *Aspects* theory. The intermediate point \( P_i \) between the \( P_1 \) and \( P_n \) of \( \Sigma \) in (1) is the level of syntactic deep structure. Then, (3) implies that \( P_i \) must be the last place where lexical transformations operate since the transformation used to form \( P_{j+1} \) from \( P_j \) for \( j \geq i \) is nonlexical. A lexical transformation as we can see from (2) is just an instruction that we replace a substructure \( Q \) (cf. the complex symbol of Chomsky [1965:84]) with the lexical item associated with it. One consequence of the suggestion that "for \( j \geq i \), the transformation used to form \( P_{j+1} \) from \( P_j \) is nonlexical" is that once a nonlexical or true syntactic transformation has applied, no lexical transformation can again apply.

The implication of this position of the standard theory for Yoruba
shall be discussed in the next few sections. Yoruba has some nominalization prefixes like `a`- (usually an agentive nominalization prefix), `i`- (usually an abstract noun nominalization prefix) and `a`i`- (which is both a negative abstract noun and a negative gerundive nominalization prefix). These prefixes derive nouns from verb phrases (hereafter VP) most of which are obtainable only after the operation of nonlexical or true syntactic transformations (hereafter transformational or T-rules). The dilemma now is: should there be another lexical insertion stage where nouns formed from VP's derived only after the operation of T-rules are inserted, thereby violating the requirement of the standard theory that lexical insertion takes place in a block in the deep structure? Or is there any way of solving the lexical insertion problem without violating this requirement? One may note that at present, any lexical item that cannot be inserted anywhere in the syntactic structure $\Sigma = (P_1, ..., P_i, ..., P_n)$ of the standard theory of generative grammar is not describable by the grammar.

Instead of suggesting another lexical insertion stage apart from the one at the level $P_i$ of syntactic deep structure (thereby adopting the multiple lexical insertion policy of the basic theory or of generative semantics), this paper is proposing an alternative to lexical insertion for Yoruba complex nouns in the transformational subcomponent of the standard theory. The lexical amalgamation proposal for complex nouns in section 5 involves, simply, the amalgamation of all the formatives which constitute the terminals\(^1\) of the last derived phrase marker under a complex noun category into a single word. A complex noun, for the purpose of this paper, is defined as one containing verb phrases obtainable only after the operation of pure nonlexical or T-rules (not derivational constraints). Although it operates inside the transformational subcomponent, lexical amalgamation is not a transformational rule, and it takes place only on

\(^{1}\)From Chomsky [1965:84], we find that the application of categorical rules ends with the occurrence of preterminal strings which consist mainly of complex symbols. The terminals are obtained through the use of lexical transformations which replace the specified syntactic features or complex symbols that form the preterminal strings with the appropriate lexical formatives.
constituents to which no other transformational rule ever applies. Its operation is demonstrated diagrammatically in section 5. Some of its consequences and implications for syntactic theory are stated in section 6.

In section 2 we examine some Yoruba nominalization processes and express them in rule form. Section 3 deals with simple nouns derived through the use of selected Yoruba nominalization prefixes while section 4 sets out the lexical insertion problem arising from the nominalization of syntactically derived verb phrases.

2. Some Verb Phrase Nominalization Processes

Yoruba grammarians have often recognized the productivity of Yoruba nominalization processes. Some typical comments are:

(4) "Yoruba has an almost unlimited power of making nouns from other words."
Ward [1952:179]

(5) "For example, any verb, adjective, predicate phrase, clause or clause complex in Yoruba can be nominalized or negativized by adding the morpheme ọ as a prefix to the nominalized element."
(italics supplied)
Afọlayan [1968:449]

(6) "Again, the use is made of a-, a- and ọ and some features of reduplication to nominalize almost any verb, adjective, predicate phrase, clause or clause complex in Yoruba."
(italics supplied)
Afọlayan [1968:449]

Both Ward and Afọlayan recognize the productive capacity of Yoruba nominalization processes as we see from (4) to (6). But only Afọlayan's statement is relevant to this discussion because he spelt out the sources of nominalizations.

Although Afọlayan's statement in (5) and (6) is not strictly accurate,²

²Afọlayan's statement is not actually accurate because from (5) we find that all adjectives are nominalizable with ọ. But Afọlayan made a distinction between a class he calls attributive adjectives and another one, predicative adjectives, and only the latter are nominalizable. Hence from his attributive adjectives like títóbi 'big', ọlá 'big' and dáradára 'good' we cannot derive *ọtítóbi, *ọlola and *ọlódáradára respectively. Also, he does not recognize exceptions to nominalizable VP's. But VP's
we may just extract from it the idea that all verbs and verb phrases are nominalizable. /àl/ derives nouns from all verbs and VP's with the exception of VP's starting with the focus markers ni 'is' or 'it is' and kò or kò ni 'is not' or 'it is not' as well as those starting with the progressive aspect auxiliary n = /ù/. Incidentally, all other auxiliary-like elements in Yoruba and pre-main-verb adverbs can start nominalizable VP's. For instance, VP's can start with máa 'be going to', yío 'shall/will', ní 'shall/will' for negative contexts, lè 'can' or 'be able', or with pre-main-verb adverbs (Bamgbose's "unrestricted preverbs") like tilè 'even', kòkò 'first', kúkú 'rather', tún 'again', sèè 'just' mọọmọ 'intentionally', etc., and such VP's are nominalizable with the /àl/ prefix. But the listed auxiliary-like elements and the pre-main-verb adverbs themselves are not nominalizable since they are bound in VP structure. So from the VP's in (7), we can have the nouns in (8), but we cannot derive the ones in (9) from the initial VP items alone:

(7) a. ní sè (NEG-shall do) 'shall not do'
   b. lè máa fé puró (can be-going-to like-to lie) 'may be willing to tell lies'
   c. tilè fé sè isè (even want do work) 'even likes to work'
   d. tètè jaì (quickly steal) 'steal quickly'

starting with focus markers like ni 'it is' or with the progressive aspect auxiliary are not nominalizable.

3 See Bamgbose [1966]. Bamgbose simply treated all VP items before main verbs as "preverbs" and subclassifies them according to order of appearance in surface representation.

4 Some of our examples are followed by word-for-word glosses in round brackets and actual translations in single quotation marks. When two English words correspond to one Yoruba word in the word-for-word translation, the English words are connected with a hyphen. But the word-for-word glosses do not always necessarily appear. In the representation of Yoruba examples, two tones are indicated. They are: the high tone = ' and the low tone = ' above the appropriate syllabic nasal or vowel letter. The mid tone is not represented. The underdot is used to distinguish e = [ɛ], o = [o], s = [s] from e = [e], o = [o] and s = [ʃ] respectively.
(8) a. àiníše 'idleness'
   b. àlèmàfèpuró 'unwillingness to lie'
   c. àltèlèfésìsì 'unwillingness to work'
   d. àltètèjale 'not stealing quickly'

   a. *àài 'not being shall'
   b. *àalè 'not being can'
   c. *ààiìle 'not being even (Adv.)'
   d. *ààiìlè 'not being quickly'

However, from verbs which can constitute single element VP's, i.e. free verbal items, we derive nouns through the /àì/ operation, e.g.

(10) a. àlpuró 'not lying'
   b. àljàjale 'not stealing'

From the preceding discussion, since single verbs can be taken as single element VP's, the only useful nominalization rule here is one which derives nouns from VP's and not from verbs (as Afọlayan's statement suggests).

The problem of the progressive aspect auxiliary is easily handled in relation to the second productive nominalization process which applies to all verb phrases, that is, Afọlayan's "features of reduplication". The reduplication of the initial consonant of the verb phrase and the insertion of vowel /ì/ on a high tone between the geminate consonant cluster thereby created leads to the derivation of Yoruba (positive) gerundive nominals. The /àì/ operation is for the negative variety plus the negative abstract noun derivation. Since the progressive aspect auxiliary pronounced /ù/ or as a syllabic nasal is not a consonantal sound, it cannot be reduplicated by the rule which instructs us to double the initial consonant. And since the positive gerundive nominalization via reduplication is not possible, its negative counterpart via the àl prefixation is also impossible.

5 The Yoruba progressive aspect formative has two alternate forms of pronunciation: either a syllabic nasal which is homorganic with the following consonant or the nasalized vowel [ù]. The latter explains the exceptions to Yoruba nominalizable VP's more easily than the syllabic nasal. So, we choose the nasalized vowel in this work.
One may note that the problematic formative, ñ = /û/ may occur after other auxiliaries like màa, and that gerundivization by reduplication is possible in such cases, but this is so because the initial element in the VP now is /m/ which is a consonantal sound. Perhaps /màa+/û/ = /màaû/ 'to be in the habit of' can be considered as a single auxiliary. 6 This consideration does not affect our discussion here.

From the preceding discussion, it is possible to write the productive rules for noun derivation from VP's. The rules are stated tentatively as (11):

(11) a. N = \{/ail/ \ Starting with /ail/ \}
   RED VP

b. RED = C₁v/ \ VP C₁ VwX \ VP

Condition: VP # \{Vw \ FM \ X \ #

RED = reduplication
X = is a variable standing for any syllable or sequence of syllables or nothing
FM = focus marker (e.g. ni 'it is')
C = consonant
Vw = vowel
# = is a boundary marker

The condition on (11) takes care of all the exceptions by restricting VP to only those which do not start with vowels or focus markers. So, from there, VP's starting with /û/ (the progressive aspect auxiliary, which is the only vowel auxiliary) are excluded. Rule (lla) states that a noun is derived from either /ail/ or reduplication plus VP, i.e. from the VP affected by our condition. Then, (11b) says that reduplication is made up of the first consonant of the VP (cf. C₁) plus the vowel /i/ before the whole VP. Since all Yoruba verbs start with consonants (for reasons we do not know), when the verbs are not preceded by auxiliaries or pre-main-verb adverbs in VP's, (11) still covers them.

It should be noted that the word derivation rules in (11) are not yet

6In Òkè [forthcoming], it was suggested that /màaû/, i.e. [màa] + [û], is a single Yoruba auxiliary contrary to the practice of other grammarians, including Òkè at an earlier stage, who regard them as two auxiliaries.
stated as phrase structure rules for which we need rewriting arrows, and they are not transformational rules. They are word derivation rules as stated. In section 5, (11a) will be introduced into the categorical sub-component of grammar. Since (11b) is context-sensitive and does not contain category symbols on the right of the equality sign, it cannot be reformulated as a categorial rule. It is actually a phonological rule, so it cannot apply until all transformational rules have applied. More will be said about (11) in section 5. But one final point about (11) now is that the positive abstract noun derivation rule, i.e. /1/ + VP, is excluded from our tentative rule, (11), only because it does not apply to all VP's. But we sometimes refer to it or to its products to give the positive version of our negative gerundive/abstract noun derivations.

3. Internal Structures of Simple Nominalized VP's

Rules (11a-b) apply to simple monosyllabic verbs as well as complex VP's. When they apply to simple monosyllabic verbs or adjective-like verbs like those in (a) to (e) of the table in (12) below for the derivation of minimal nouns (note that no Yoruba noun is monosyllabic so that a minimal Yoruba noun is disyllabic), there is no lexical insertion problem since they can be entered in the lexicon side by side with other nouns (derived or basic). Also, when they apply to VP's which appear not to be the result of structural changes of transformational rules, e.g. those in (12f-i) below, there is no problem since no T-rule has applied so that lexical insertion is still possible. The noun derivations which create problems are discussed in section 4.

Some examples of derived nouns using (11) which constitute no problems in Yoruba syntax are given in the table of (12). We draw up the table to show the result of rule (11) when it operates and to justify our exclusion of the (positive) abstract noun prefix from (11). One may note that where we have asterisks indicating the unavailability of lexical items for abstract nouns in column 2, all the other columns have formatives, and vice versa (cf. 12ei-ii). Note that where we have no /1/ + VP abstract forms for some forms in (12), e.g. in (b), (c), (d) and (eii), there are other abstract nouns like ogbon 'wisdom' and orun 'sleep' for (c) and (d) respectively.
It is the existence of these basic, i.e. non-derived, abstract nouns which actually forbids the /\ + VP derivation in those places. This is why we have found it difficult to ignore the /\ + VP derivation completely in this work.

In (12), PAN = positive abstract noun nominalization, PGN = positive gerundive nominalization through reduplication, NAN + NGN = negative abstract and negative gerundive nominalization, and NE = not exist.

7The main reason why the abstract noun rule is less productive than the negative abstract/gerundive and positive gerundive rule is that we usually have basic (i.e. non-derived) abstract nouns in place of our asterisked items. So, where such exist, the /\ + VP rule does not normally derive other abstract nouns. This is why there are more of the asterisked or impossible derivations in places where there are longer VP's. Since Yoruba minimal nouns are disyllabic, minimal (non-basic) abstract nouns must also be disyllabic, and their existence usually forbids the occurrence of derived varieties.
(12) **Examples of nouns derived through the rules in (11)**

<table>
<thead>
<tr>
<th></th>
<th>VP</th>
<th>PAN</th>
<th>PGN</th>
<th>NAN + NGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td><em>fé</em></td>
<td><em>lífé</em></td>
<td><em>fífé</em></td>
<td><em>làf fé</em></td>
</tr>
<tr>
<td></td>
<td>'to love'</td>
<td>'loving'</td>
<td>'not loving'</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td><em>dára</em></td>
<td><em>dídára</em></td>
<td><em>àdídára</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'to be good'</td>
<td>NE</td>
<td>'being good'</td>
<td>'not being good'</td>
</tr>
<tr>
<td>c</td>
<td><em>gbón</em></td>
<td><em>gbigbón</em></td>
<td><em>àgbón</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'to be wise'</td>
<td>NE</td>
<td>'being wise'</td>
<td>'not being wise'</td>
</tr>
<tr>
<td>d</td>
<td><em>sún</em></td>
<td><em>sísùn</em></td>
<td><em>àsùn</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'to sleep'</td>
<td>NE</td>
<td>'sleeping'</td>
<td>'not sleeping' or 'sleeplessness'</td>
</tr>
<tr>
<td>e.i.</td>
<td><em>še</em></td>
<td><em>lísé</em></td>
<td><em>sísé</em></td>
<td><em>àsísé</em></td>
</tr>
<tr>
<td></td>
<td>NE</td>
<td>'wretchedness'</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>ii.</td>
<td><em>še</em> (igi)</td>
<td><em>lísé (igi)</em></td>
<td><em>sísé (igi)</em></td>
<td><em>àsísé (igi)</em></td>
</tr>
<tr>
<td></td>
<td>'to fetch firewood'</td>
<td>NE</td>
<td>'fetching of firewood'</td>
<td>'not fetching firewood'</td>
</tr>
<tr>
<td>f</td>
<td><em>pa ànìyàn</em></td>
<td><em>pìpànìyàn</em></td>
<td><em>àpìpànìyàn</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'kill people'</td>
<td>'murdering'</td>
<td>'not murdering'</td>
<td></td>
</tr>
<tr>
<td>g</td>
<td><em>gbà gbó</em></td>
<td><em>gbìgbàgbó</em></td>
<td><em>àgbìgbàgbó</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'listen and accept' i.e.</td>
<td>'believing'</td>
<td>'disbelieving'</td>
<td>or 'not believing'</td>
</tr>
<tr>
<td>h</td>
<td><em>dúró śinśin</em></td>
<td><em>dídúróśinśin</em></td>
<td><em>àdídúróśinśin</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'stand closely'</td>
<td>'steadfastness'</td>
<td>'steadfastness'</td>
<td>'pusillanimity'</td>
</tr>
<tr>
<td>i</td>
<td><em>sé owó</em></td>
<td><em>líséwó</em></td>
<td><em>síséwó</em></td>
<td><em>àsíséwó</em></td>
</tr>
<tr>
<td></td>
<td>'change money' or 'practice prostitution'</td>
<td>NE</td>
<td>'changing money' or 'practicing prostitution'</td>
<td>'not changing money' or 'not practicing prostitution'</td>
</tr>
</tbody>
</table>
4. **Syntactically Derived VP's as Source for Nouns**

We shall limit our examination here only to VP's which have transformationally derived formatives. The first to be considered is the reflexive since the formative ara 'self' is transformationally introduced into reflexive VP's obligatorily.\(^8\) When the subject and object of a sentence are coreferential, and the main verb is not copulative in form and function, the reflexive formative ara 'self' is obligatorily adjoined as the left sister of the second or repeated NP. This obligatory sister adjunction of the reflexive formative also converts the second or repeated NP into a genitive (or an associative) form. The sister adjunction and genitivization operations are stated as (13). Sometimes the repeated NP is pronominalized. This second operation on the output or structure change (SC) of (13) is stated as (14):

\[(13)\]  
\[
\begin{array}{l}
\text{SI: } [S \ W \ \text{NP} \ [VP \ \text{AUX} \ X \ V \ Y \ \text{NP} \ Z ]_{VP}]_S \\
1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ \Rightarrow \\
\text{SC: } 1 \ 2 \ 3 \ 4 \ 5 \ \text{ara}+7g \ 8 \\
\end{array}
\]

(where g = genitive, and W, X, Y, and Z are variables)

\[(14)\]  
\[
\begin{array}{l}
\text{SI: } [S \ W \ \text{NP} \ [VP \ \text{AUX} \ X \ V \ Y \ \text{ara} \ \text{NP}g \ Z ]_{VP}]_S \\
1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ \Rightarrow \\
\text{SC: } 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ \text{PRON}g \ 9 \\
\end{array}
\]

Conditions:  
(i) Optional  
(ii) 8 is not a PRON(oun) but it may be a "PRONOM(inal)"\(^9\)

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\(^8\)In addition to its transformational derivation in reflexive structures, ara 'self' can also occur in the intensive use of the personal pronoun, e.g. in 'èmi fúnra mi (I for-self my)' 'I myself'. Apart from this intensive use, ara 'self' is only a transformationally derived formative.

\(^9\)Bamgbose [1966] made a distinction between "pronouns", i.e. conjunctive pronouns, like mo 'I' and "pronominals", i.e. disjunctive pronouns, like èmi 'I'. The pronominals have the syntactic characteristics of nouns, so we can say that they are replaceable with pronouns.
Suppose we have (15a) where both repeated items are coreferential:

(15) a. ?Ojo féran Òjó  (Ojo love Ojo)

?'Ojo loves Ojo'

Then we use (13) to derive:

b. Òjó féran ara Òjó  (Ojo love self of-Ojo)

After the application of (14) we obtain:

c. Òjó féran ara rè  (Ojo love self his)

'Ojo loves himself'

Both (15b) and (15c) are grammatical since rule (14) is optional. The only crucial rule for us here is (13) which shows how ara is transformationally introduced. So when reflexive VP's containing this formative are used for noun derivation through rule (11), we have a lexical insertion problem.

Since our main business is with the VP, we shall now ignore sentential structures like the SI's of (13) and (14). Suppose we now have the transformationally derived VP in (16):

(16) mọ ti ara eni nikan  (know of self of-one only)

'look after one’s own affairs only'

Then we can use (11a-b) to derive (17a-b) where the transformationally derived formative ara is underlined:

(17) a. àmọtaraeninikan  'selflessness'

b. mímọtaraeninikan  'being selfish'\(^{10}\)

Since a true syntactic transformation, the reflexivization rule, has applied prior to the application of (11) to derive (17a-b), these derived items now constitute a problem since by (2) and (3) above, they cannot be inserted anywhere in the grammar. Note that the negative abstract/\(^{10}\)The positive abstract noun version of (17), which is a very common Yoruba word is 'mọtaraeninikan 'selfishness'. This common word contains a transformationally inserted formative (ara) which creates a lexical insertion problem for a Yoruba generative syntax.
gerundive noun and the (positive) gerundive noun in (17) each constitute just one lexical item (and also an orthographic word) in the Yoruba language. Note also that the Yoruba reflexive transformation is obligatory.

Another Yoruba transformational rule which obligatorily introduces formatives into SC's is the relative. The Yoruba relative marker, tf, is transformationally introduced when certain items in embedded (or constituent) sentences are coreferential to some elements in matrix sentences. We shall not state the relative as a rule. Instead, we shall draw tree diagrams in (20) showing how (19) is obtained from (18):

(18) \[ NP \omo_i \[S \omo_i f^o oju ]_S \] \_NP \ (child, child, break eye)

(19) \[ NP \omo_i tf [S \omo_i f^o oju ]_S \] \_NP \ (child, WH he, break eye)

'the child who is/was blind' or 'the blind child'

(20)

If the phrase structure (PS) tree diagram on the left in (20), which represents (18), is considered as the structure index, then the tree on the right, i.e. the PS diagram for (19), constitutes the structure change of a transformational rule. In the SC, the formative tf (REL) has been introduced obligatorily through adjunction to the left of the embedded sentence.

Now consider the VP in (21) where a noun or a NP is needed to replace X:

(21) fi \_X gun ose \ (use X pound soap)
    'use X for preparing soap'.

In place of X in (21) we can insert the whole of (19), i.e. the derived phrase marker in (20), to obtain:

11 The relative is discussed in Ekundayo [1972]. The conditions under which the transformationally derived obligatory REL element may be optionally deleted are stated there.
(22) ți ó fó ojú gún ọsẹ  (use child REL he break eye pound soap)
     'use a blind child for preparing soap'

Now we can use the whole of (22), which already contains a transformation­
ally derived formative ți (REL), to derive the nouns in (23):

(23)  a. ̀tífómọtọfójúgúnọsẹ  'using a blind child for preparing soap'
    b. ̀̀tífómọtọfójúgúnọsẹ  \{NEG abstract\}  'failure to use a blind child to prepare soap',
    \{NEG gerundive\}  'not using a blind child (or blind children)
     for preparing soap'

The complex derived items in (23) are nouns because they can be modified
(like nouns) by determiners. For instance, the demonstrative yen 'that' as well as yi 'this' can modify either (23a) or (23b), e.g. ̀tífómọtọfójú­

    ̀tígúnọsẹ  yen  'that failure to use a blind child to prepare soap'. And they
     can function (like nouns) as subjects or objects of verbs, and also as the
     objects of prepositions. They are also replaced with pronouns when neces­

sary. We have (23a) as the subject of a verb in (24a), as an object in
(24b), as the object of a preposition in (24c); it is replaced with a pro­

    noun in (24d) as the referential indices show, and it is qualified like
    nouns by the adjective burúkú 'bad' and the demonstrative yen 'that' in

(24)  a. ̀tífómọtọfójúgúnọsẹ  kò dára  '(23a) is not good'\(^\text{12}\)
    b. ó jọ ̀tífómọtọfójúgúnọsẹ  'it resembles (23a)'
    c.  mo lù ú fún ̀tífómọtọfójúgúnọsẹ  'I beat him for (23a)'
    d. ̀tífómọtọfójúgúnọsẹ\(_1\) ni ó \(_1\) lé Đəji ọ́ ní ɨ́lú
        (\(_2\)\(_3\)) \(_2\) is it\(_2\) drive Deji go from town)
        '(23a) is what drove Deji out of the town'
        (where coreferential items have the same index)
    e. ̀tífómọtọfójúgúnọsẹ  burúkú yen ni a ǹ sọ
        'it is that bad (habit of) (23a) we are discussing'

\(^{12}\)We shall not repeat the gloss for (23a) in each of (24a-e) in order to
    save space. Instead, we shall represent it as (23a); and the full gloss
of each of the expressions in (24) can be obtained by substituting the gloss
for (23a) for the representation (23a) in (24a-e), e.g. (24a) is 'using a
blind child for preparing soap is not good'.
Like (23), the two derived items in (17) (including the abstract noun 'selfishness' from footnote 10) also behave as nouns in syntactic structure.

Furthermore, only nouns can be modified by nouns in the Yoruba noun phrase. These items are modified by nouns, and their nominal modifiers become genitivates or what some grammarians recently have referred to as associatives, e.g. in

(24) f. mímtaraeninikan Adélù (being-selfish of-Adelu) 'Adelu's selfishness'

However, (23a-b) contain the whole of the relative structure in (19) so that a major part of their constituents is the output of a true syntactic transformation. Hence, by (2) and (3) which forbid lexical insertion after the operation of nonlexical transformations, the lexical insertion of (23a-b) and an infinite number of similarly derived nouns is prohibited.

We can make (24e) more interesting and complex by allowing one burúkú to be a constituent of the complex word and another one a qualifier of the new complex item as in (25).

(25) îffomotofójúgoñosèburúkú burúkú yen ni 'it is that bad use of a blind child for preparing bad soap'

So far we have been considering the single application of rule (11) to VP's. Actually, application may be recursive. We may consider only the àl + VP operation now although the reduplication operation covers the same set of VP's. The /àl/ rule applies to all conceivable VP's if the condition on rule (11) is noted. Since this rule applies to practically all VP's, and some of the nouns used in such VP's might also have been derived through the àl or "RED" operation, it can apply and re-apply to structures indefinitely. So, when àl + VP applies, a repeated application of the operation to other repeated applications could lead to the complex noun subject of kò burú 'is not bad' in (26).

(26) âlfàmalàmàldárasàldárasàldárasàl'màldára kò burú13

13When an earlier version of this paper was presented at the 11th West African Languages Congress in Yaoundé, Cameroun (April 1974), some native
The subject noun in (26) is obtained after seven repeated applications of the /àl/ + VP operation as the underlining of ‘àl’ indicates. A rough translation of the complex noun is 'not taking advantage of a failure to know one who has no conscience to misbehave to the person who has no conscience'. Within the complex noun are other nominalizations like àldára 'not being good' or 'evil', àlmàl'dára 'not recognizing evil', alàlmàl'dára 'one who does not know what is not good' or 'one who does not recognize evil', etc. The important point about (26) is that its subject noun will be recognized as one lexical item, a single noun like (23a-b) in the Yoruba language. And since this /àl/ rule derives single lexical nouns from practically all VP's including those that have undergone all types of true syntactic transformations, condition (3) above will make the lexical insertion of these nouns impossible. Furthermore, we do not know the number of VP's in Yoruba, so one can say that the àl and RED(uplication) rules derive an infinite number of nouns; and that condition (3) makes the lexical insertion of this infinite set of lexical items impossible.

So we now find that there is a lexical insertion problem for complex noun derivations in the Yoruba language. We saw from (2) and (3) that lexical insertion must take place before any true syntactic transformation applies. For many Yoruba noun derivations, this condition poses no problems even when the VP's in (12f-i) are used as stems. However, there are VP's for which a problem exists. These are the ones which had already undergone true syntactic transformational operations. In this work, we exemplified the second class of VP's only with those into which formatives are transformationally introduced. An infinite set of other VP's are derived through the use

speakers of Yoruba objected to the production of the subject noun of (26) on the ground that such complex items are not taught in schools, but everybody agreed that although it can be regarded as an entirely new lexical item, it is Yoruba, and it can be interpreted by any native speaker of the language. In the spoken language, one may never come across a noun involving as many as seven repeated applications of the /àl/ + VP rule like (26). But I often hear simple cases of repeated applications as in àlfàlmàsèé 'not failing to do it'. So, (26) is just an extension of such expressions. The important point, however, is that repeated applications exist.
of elementary transformations, and they also function as stems for noun derivation when (11) applies. Since, after the application of (11), these complex derived VP's plus their prefixes become single lexical items (like (17) and (23)), they operate in the structural positions of Yoruba nouns (as in (24a-f)), and these problematic lexical items also constitute an infinite set as we have already observed, the lexical insertion of this set of nouns anywhere in the syntactic structure \( L = (P_1, ..., P_n) \) is prohibited, and therefore indescribable, in a grammar which incorporates condition (3). This is so because, at present, lexical insertion is obligatory for all lexical items.

5. The Lexical Amalgamation Proposal

If we want a transformational grammar to handle the lexical insertion problem in Yoruba syntax without violating the main Chomskyan requirement of the standard theory already stated as (3) in section 1, we must suggest an alternative to lexical insertion for Yoruba complex nouns. The alternative suggested here is the lexical amalgamation proposal. Only two steps are necessary.

First, we have to introduce the complex noun into the categorial sub-component of the syntactic component. Suppose we designate the complex noun as \( N_c \) in a phrase structure grammar (PSG), then \( N_c \) can be introduced by a rule which introduces \( N(oun) \) ordinarily, e.g. in addition to a common Yoruba rule like \( NP \rightarrow N \ (DET) \ (S) \), we can have \( NP \rightarrow N_c \ (DET) \ (S) \).\(^{14}\) The two possibilities can be combined together into a single rule like (27a). Examples (27b-c) show how \( N \) and \( N_c \) are separately developed. Since \( N_c \) is now a category of the PSG, we can replace the equality sign of the word derivation rule (11b) with a rewriting arrow:

\[^{14}\text{Instead of recognizing } N_c \text{ as a different syntactic category from } N, \text{ we may just have the rule } NP \rightarrow N \ DET \ S \text{ and another rule } N \rightarrow N_c \text{ where } N \text{ is rewritten as a category symbol; but we hesitate to take that alternative because, in the standard theory, only complex symbols occur on the right of the arrow whenever } N \text{ is on the left.} \]
The condition under which Nc gets expanded was stated in (11) earlier. That condition need not appear with our rewriting rule since it is just the type of statement linguists always ignore. Also, the further expansion of RED uplication in (11b) is beyond the scope of the categorial section of grammar since only phonological symbols like consonant and vowel appear on the right of the equality sign. The VP labels for the brackets are not parts of the relevant symbols since they serve merely as boundary markers for the relevant phonological symbols.

The second step is the erasure of word boundary symbols for all formatives under any Nc category followed by their amalgamation into a single word in the transformational subcomponent when transformational rules cease to apply. The only condition for the disappearance of word boundary symbols between the affected formatives and their eventual amalgamation into a single word is the ultimate dominance of all the formatives somewhere in the categorial section by the category symbol Nc. We illustrate this process with only one tree diagram. In this diagram, in order to show that lexical amalgamation is not a T-rule, we allow for several occurrences of Nc under one principal Nc category. From the step by step description of how sentence (28) is derived from (29), we see how lexical amalgamation operates.

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15Actually, we need not state any condition on rule (11) since nobody states such. For instance, the S in Yoruba PS rule NP → N DET S can dominate a relative but never an imperative or interrogative sentence; yet this S is not specially marked, nor is there any condition in the categorial subcomponent indicating that it is not imperative or interrogative. Similarly, VP is always written as VP in rules although the VP in (27c) excludes those prohibited by the condition on (11).

16Instead of using the formative boundary symbol, +, to represent word boundary in (29), we use the empty space between words for this purpose. So, since we do not use boundary symbols, the first part of the lexical amalgamation operation, which deletes boundary symbols, applies vacuously.
Let us examine sentence (28) in which the transformationally inserted formatives, one REL item and the reflexive formative ara 'self', are underlined. The English translation of the complex noun is also underlined.

(28) ̀àiìfàlògbònlórífìgòtàtífóbáláfúnarènìsìmìjà ni á bú Délé fún

'not using a broken bottle to fight against one who does not give himself any peace of mind owing to lack of wisdom is what we condemned Dele for'

The generalized phrase marker for (28) is given as (29) and in that diagram, category symbols are numbered to facilitate our description of the transformational and amalgamation processes. Also, referential indices indicate coreferential items.

The complex subject of (28), which also occurs as the configuration under the NC1 category in (29), is a single Yoruba noun (or nominal) by function since it operates in the structural positions of single nouns. The most significant of these structural positions were illustrated in (24) above. Example (28) occurs in all the identified positions. It is also a noun by form since it takes a noun derivational prefix. Hence, we have followed the example of linguists who define parts of speech as nominals, adjectivals, adverbials and verbals by function, but nouns, adjectives, adverbs and verbs by form. We can say that the subject of (28) is a nominal and a noun. We may now look at tree diagram (29) in which FM is a focus marker.
'we condemn Dele for it'

(NZF = nominalization formative)
For a description of how (28) is obtained from (29), we start from $S_8$. The coreferential items which are marked with the index $j$ make $S_8$ satisfy the structure index for the reflexive (transformational) rule in (13). So the obligatory rule (13) and the optional (14) apply, giving us for $S_8$

$$S_8 = \text{'someone (does not) give himself some rest'}$$

After an indefinite subject NP deletion rule has deleted $\text{'someone'}$ from $S_8$ because it is coreferential to $\text{oni}_j$ 'the person who is closely connected with (something)' or 'the owner of (something)' higher in the tree, we are left with a VP which becomes $VP_8$. No other T-rule can apply to the constituents of $VP_8$, so the lexical amalgamation of $\text{‘not’}$ and all the formatives dominated by $VP_8$ takes place giving us a single word under $NC_4$.

$$NC_4 = \text{‘not giving himself some rest’}$$

The two possibilities in (31) are synonymous since $\text{‘not’}$ is optional and semantically insignificant after $\text{‘not’}$ in $\text{‘not’} + \text{VP}$ nominalizations. The element will be omitted henceforth.

At $NC_3$, we have $\text{oni} + NC_4$. No transformational rule can now apply to the constituents of $NC_3$, so the lexical amalgamation of $\text{oni}$ and $NC_4$ produces

$$NC_3 = \text{‘a person who does not give himself any peace of mind’}$$

After other syntactic operations on higher constituents, e.g. the transformational permutation of $\text{jà} \ ‘fight’$ from $\text{bà} \text{jà} \ ‘fight against’$ to the

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17We cannot discuss the putative subjects of nominalized VP's as that is beyond the scope of this paper. But we assume that such VP's generally have indefinite subject NP's which are deleted by an indefinite subject NP deletion rule. If we do not make this assumption, our tree diagram will be simpler and less deep since many derivational steps would be omitted through the merging of several VP's, e.g. VP and VP into one. Whichever step is taken has no effect on the lexical amalgamation proposal.
right of NP₈, we reach level S₆ where we have

(33) \( S₆ = ẹni kan bá alálfúnرارेनिसिम jà \)

'someone fought against a person who does not give himself any peace of mind'

Later we find that NP₅ satisfies the SI of a relativization transformation, cf. tree diagram (20), and so we introduce tī (REL) transformationally between N and S₇ and pronominalize ịgò under S₇ to ọ giving

(34) \( NP₅ = ịgò tī ọ ti fọ \)

'the bottle which has got broken'

Then, further up in the tree, we come to S₄ where we now have

(35) \( S₄ = ẹni kan fi ịgò tī ọ ti fọ bá alálfúnرارेनिसिम jà \)

'someone used a broken bottle to fight against a man or person who does not give himself any peace of mind'

After all necessary transformational operations on the constituents of S₅ and VP₅ have ceased, we move to Nc₂ where through the lexical amalgamation of all formatives into a single word, we have

(36) \( Nc₂ = ạlọgbónlófr \)

(lit. not having wisdom in the head)

'being unwise' or 'foolishness'

After the application of other T-rules, and before final indefinite NP deletion under S₃, we arrive at

(37) \( S₃ = ẹni kan fi ạlọgbónlófr fi ịgò tī ọ ti fọ bá alálfúnرارेनिसिम jà \)

(where already amalgamated constituents of Nc's are underlined)

'someone, through lack of wisdom, used a broken bottle to fight against the person or man who does not give himself any peace of mind'

Then we have final indefinite NP deletion leaving us with VP₂, S₃ and VP₃ in a direct line of derivation, and the last two mentioned categories disappear through tree pruning giving us ạl + VP₂ alone under Nc₁. Since no other T-rule can now apply to the constituents of Nc₁, final lexical amalgamation takes place giving us a single word under Nc₁:

(38) \( Nc₁ = ạlfalọgbónlófrifigòtítifóbáalálfúnرارेनिसिम jà \)

This is the subject noun of (28) and (29).

Several steps are omitted, e.g. the assimilation of tī ọ (REL he/it)
to to, fi ègò to ègò 'use bottle', fun ara 'for self' to funra, etc., but this must be expected since phonological rules like assimilation ought not to take place in the transformational subcomponent. Actually, a step by step statement of how (28) is derived from (29) in all components of grammar does not really increase one's awareness or appreciation of lexical amalgamation.

From the preceding description we see how lexical amalgamation operates in practice. It is not ordered among the T-rules of grammar since it operates only on constituents to which no other T-rule ever applies. The product of a lexical amalgamation operation, e.g. \( (32) = NC_3 \) or \( (36) = NC_2 \), is a single noun having "syntactic features" of nouns like \([+\text{N}, -\text{Count}, +\text{Abstract} \ldots ]\), but it is not inserted like simple nouns through the lexical transformation rule (2). If we had not proposed an alternative to lexical insertion for Yoruba complex nouns, we would have been forced to recognize at least four lexical insertion stages for Yoruba in order to describe sentence (28), viz. the one at deep structure giving us the terminals in tree diagram (29), the second one at both \( NC_4 \) and \( NC_2 \), the third at \( NC_3 \), and finally at \( NC_1 \). We, however, leave a consideration of the advantages of lexical amalgamation over lexical insertion for complex nouns to the next section.

6. Conclusions

In order to falsify the Chomskyan assertion that "for \( j \geq i \) \([\text{in } \Sigma = (P_1, \ldots, P_n)]\), the transformation used to form \( P_{j+1} \) from \( P_j \) is nonlexical," generative semanticists have developed various styles of arguments. We have arguments on the synonymous relationship and identical distributional characteristics of differently categorized syntactic constructions like Lakoff's arguments on instrumental adverbs (cf. Lakoff [1968]). There are arguments on the relevance of presuppositions to semantic interpretation and the need to reflect such (linguistic and nonlinguistic) antecedents in encoding and subsequents in decoding in abstract deep structures. But the most relevant types of arguments for us have been those on lexical decomposition.

Lexical decomposition is a very fruitful area of linguistic research. Its main preoccupation is with the discovery of phrasal paraphrases which are "totally synonymous" with some lexical items while postulating these
phrasal paraphrases as underlying forms of their "surface" single item synonyms. "Total synonymy", in the sense of John Lyons, is proved through their "interchangeability in all contexts" [Lyons 1968:448]. McCawley (1968) tried to establish such relationships between 'kill' and 'cause to become not alive' while Postal (1970) provided a similar analysis for 'remind' and 'perceive to be similar'. If 'kill' is derived from 'cause to become not alive' or 'die' from 'become not alive', etc., then there must be more than one lexical insertion stage in grammar. At least, we should have one for the atomic elements used in the phrasal paraphrases and another one for the insertion of derived "surface" lexical items. The concept of deep structure, established as the only place where the lexical insertion operation of the standard theory takes place, must therefore be abandoned.

Lexical decomposition has three problems. First, if one derives (surface) 'remind' from (underlying) 'perceive to be similar', or 'die' from 'become not alive', nothing stops one from labelling all lexical words as "surface lexical items" and deriving 'spinster' from 'woman who is not married', 'widow' from 'already married woman whose husband is no longer alive', 'giants' from 'people who are too tall', 'dwarf' from 'an adult human being who is incredibly short', 'look' from 'direct the eyes', 'elude' from 'avoid compliance with', 'mock' from 'tantalize with illusion', etc. for all lexical items. The lexical items used in the decomposition of the above (e.g. 'marry') will be similarly decomposed, and all these operations must take place in the process of a single syntactic description. While this practice will give many industrious linguists the opportunity to conduct intensive research and write many thought-provoking papers on myriads of putative surface lexical items, such linguists will only be justifying, syntactically, the practice of traditional lexicographers who use the "underlying" phrasal paraphrases as the meanings of "surface" lexical entries. But this would not have proved that the concept of underlying and surface lexical items has any linguistic or psychological reality.

Secondly, interchangeability in all contexts for underlying and "surface" lexical items is very difficult to establish although this is the crux of all the syntactic arguments used. Otherwise, Fodor would not have found
three reasons for not deriving 'kill' from 'cause to die'. Like Fodor [1970], Chomsky too noticed a similar inadequacy of arguments on instrumental adverbs [Chomsky 1971:194-5]. He also commented on Postal's discussion of 'remind' and observed that the regularity of some 'remind' sentences he discussed "is a regularity statable precisely at the level of deep structure" [Chomsky 1972:154]. If only one context exists where interchangeability is not proved, total synonymy has failed and the use of one form as the underlying version of the other is no longer justifiable.

Thirdly, some arbitrariness in the determination of which semantic "atoms" must be used in the underlying representation of surface forms is inevitable. Given the two derivations: 'dead' from 'be not alive' and 'alive' from 'be not dead', one has to argue one derivation out of acceptance although both forms are correct. And this type of decision must be taken for all known lexical items. While it will give linguists plenty of materials to work on, it does not directly or positively broaden linguistic knowledge.

All considered, it seems that the use of lexical decomposition plus derivational constraints and their attendant multiple lexical insertion solution in infinitely deep abstract underlying structures just to falsify condition (3) on syntactic deep structure is like using a fully loaded machine gun to kill a troublesome housefly. In a grammar where lexical insertion is mandatory for all lexical items, all we need to falsify condition (3) is the existence in any human language of complex single item words containing formatives not derivable anywhere in grammar without a prior application of the true syntactic transformations of the standard theory. Once such words, e.g. 'méricain' 'selfishness', are obtained, we do not need innumerable syntactic arguments to prove the interchangeability of some forms in all contexts before concluding that a lexical insertion problem exists. If lexical insertion were to remain mandatory for all lexical items, then we would have clearly falsified condition (3) on deep structure through any of the examples of complex nouns in section 4. Our proposal in section 5 is for an alternative to lexical insertion for such complex nouns through lexical amalgamation, and only such alternatives can save or validate condition (3) which is the condition that lexical items are inserted only once in the syntactic deep structure.
One may be expected to examine the discussion here in relation to Chomsky's proposal on nominalizations. Since the complex nouns for which rule (11) is established are either positive or negative gerundive (although the negative is also abstract), they fit into the class of nominalizations for which Chomsky suggested a transformational derivation in his lexicalist paper [Chomsky 1970]. However, Chomsky's gerundive nominals are derived from verbs whereas ours are derived from verb phrases. That is the main cause of difference. Since verb phrases can be complex internally, single word nouns derived from such transformationally derived complex VP's must be complex. Our argument rests on the internal complexity of VP's used as stems for noun derivation, so any similarity between our observations and Chomsky's on gerundive nominals is merely accidental.

Then, with the proposal of an alternative to lexical insertion, we have been able to suggest some answers to certain problematic questions. One deals with the problem of new derived lexical items not recorded by lexicographers in dictionaries. Yoruba authors, translators and news writers coin or create new words everyday, and these are understood by other Yoruba speakers just as speakers of languages create new sentences which are understood by others. How can such novel items be inserted in deep structure when

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18 Some Yoruba examples in 1975 are given here: agbomiró (a + VP = [gba omi ró]) for 'water pipe' constructed by the present writer while translating a Christian Science lecture on the power of prayers by Albert B. Crichlow. (See A.B. Crichlow, 1973 1975, "Agbára Adúrá," Christian Science Board of Directors, Boston, Mass., p. 1.) On June 4, 1975, we had àjò káfòwòwòkòlèèwò ọmọ Nigeria àti Britain as a Yoruba translation of 'the Nigeria-Britain Friendship Association' from W.N.T.V./W.N.B.S. news broadcast at 7:30 p.m. The neologism káfòwòwòkòlèèwò can be translated literally with the sentence 'it is not wrong for people to mix together'. Then, on Monday, 3rd November, 1975, from the same television network during a similar broadcast at 7:30 p.m., we had bí orin še jé apábanújérun with a repeated application of prefix plus VP, viz. a + VP = [pa i + VP = [ba inú jé] run], where the new word apábanújérun is translatable as 'something which destroys sorrow'. If lexical insertion in deep structure is not supplemented with lexical amalgamation elsewhere, then lexicographers must anticipate all new syntactically derived nouns and record them in dictionaries for lexical insertion purposes in the standard and basic theories. No such dictionary can be constructed.
the lexical subcomponent of the base makes use of only items found in
dictionaries? This is not a problem for the standard theory alone since all
the surface and underlying lexical items of the basic theory, e.g. 'remind'
and 'perceive to be similar', are recorded in dictionaries. However, an
infinite number of nouns can be constructed from Yoruba VP's and it is
obvious that no dictionary can record this infinite set. Hence, a process
like lexical amalgamation is needed in transformational grammar (whether
standard or basic) to account for this infinite set of lexical items which
dictionaries cannot handle.

Another problem with which transformational grammarians are beset deals
with delimiting the boundaries of any grammatical description. Chomsky's
metatheoretic arguments for condition (3) rest simply on this. If lexical
amalgamation as suggested here were incorporated into grammar, it would then
be possible to validate Chomsky's statement that "no linguistically signi-
ficant generalizations are lost if all the transformations of L (i.e. lexical
transformations) are applied before any transformations of non-L (i.e. non-
lexical transformations) in forming derivations. This proposal constitutes
a potential step forward in that it restricts the class of grammars"
[Chomsky 1972:128]. We do not know how "the class of grammars" is restricted.
However, since lexical amalgamation is not lexical insertion, Chomsky's
statement here as well as condition (3) now stand. But their validity de-
pends solely on the incorporation of lexical amalgamation into transforma-
tional subcomponent of grammar.

It then appears that generative semanticists, who seem to constitute
the majority in the transformational school, find the lexical insertion
requirement of a standard theory inconvenient, and consequently, find the
standard theory itself intolerable, mainly because they prefer the abroga-
tion of the syntactic deep structure to the provision of alternatives to
lexical insertion for problematic lexical items.

Finally, although this paper has not actually demonstrated one way or
the other whether deep structure exists (thereby not falling within what
Bedell [1974] described as "the arguments about deep structure"), it has
taken one step towards the Chomskyan requirement on restricting the class
of grammars by not throwing out the concept of deep structure after the
establishment of our Yoruba lexical insertion problem. What is not known is whether all transformational grammarians will think it worthwhile to take Chomsky's "potential step forward" which "restricts the class of grammars." And so, it appears that our most crucial question now is: "How abstract can syntax be in a limited or restricted class of grammars?"

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