Determiners and Adjectives in English
Premodification*

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1. Introductory Remark

In this paper the role of determiners and adjectives in English pre-modification is examined in terms of a Recursive Categorical Syntax approach. The focus of analysis is condensed into the following three claims: (i) adjectives are nullary words, hence they do not take an argument, (ii) a binary zero determiner exists, and (iii) there is no noun phrase which does not have a determiner as its introducer.

2. Classical Transformational Analysis

In classical transformational analysis, a noun phrase such as (1a) is produced from its source (1b) by the use of two transformational rules ‘whiz deletion’ (or ‘relative clause reduction’) and ‘adjective preposing’. A representative derivation is given in (2).

(1) a. the crazy linguist
   b. the linguist who is crazy

   whiz deletion

(2) a. the linguist who is crazy  
    ↓  ↓
    ∅  ∅  

   adjective preposing

   b. the linguist crazy  
   ↑  |

   c. the crazy linguist

The whiz deletion transformation eliminates two constituents who and is
of the underlying structure (2a). The result of this operation gives rise to the adjective preposing rule; the adjective *crazy* is removed from its original position and transferred into the prenominal position between *the* and *linguist*.

As shown above the classical transformational analysis attempts to relate a relative clause to a noun phrase in order to produce the latter from the former. As a consequence, a base generation alternative is totally ignored. In the alternative, a noun phrase such as (1a) is generated at the base without recourse to transformations. This can be achieved by incorporating a rewriting rule NP \(\rightarrow\) (Art) (Adj) N in the framework of traditional transformational grammar. The idea of base generation seems to be absorbed in the later development of generative linguistics, namely in the theory of X-bar syntax.

3. X-bar Syntax Analysis

Under the theory of X-bar syntax (1a) can be base generated as shown in (3). This makes the whiz deletion and the adjective preposing superfluous.

(3) the crazy linguist

```
      N''
     /   \
DET   N'
   /     \
AP     N'
  /       \
A       N
```

The X-bar syntax analysis seems to be superior to the classical transformational analysis on the ground that the former can generate the construction (1a) in a simple, straightforward way without assuming ad hoc transformational devices such as whiz deletion and adjective preposing. There are, however, problems which cannot be adequately accounted for within the X-bar syntax approach.
3.1. Problem I

Essentially there are two functions adjectives exhibit: 'attributive' and 'predicative'. Adjectives which occur in premodification such as in (1a) are called 'attributive,' whereas adjectives which appear in predicate environments such as in (1b) are termed 'predicative'. Though most adjectives can be either 'attributive' or 'predicative', there are exceptional cases. Some adjectives function only as 'attributives', while some others function exclusively as 'predicatives.'

(4) adjectives functioning exclusively as 'attributive'

<table>
<thead>
<tr>
<th>-er</th>
<th>-en</th>
<th>-est/-most</th>
</tr>
</thead>
<tbody>
<tr>
<td>elder</td>
<td>earthen</td>
<td>eldest</td>
</tr>
<tr>
<td>former</td>
<td>golden</td>
<td>uppermost</td>
</tr>
<tr>
<td>inner</td>
<td>maiden</td>
<td>utmost</td>
</tr>
<tr>
<td>latter</td>
<td>silken</td>
<td></td>
</tr>
<tr>
<td>outer</td>
<td>wooden</td>
<td></td>
</tr>
<tr>
<td>upper</td>
<td></td>
<td>lone</td>
</tr>
<tr>
<td>utter</td>
<td></td>
<td>main</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mere</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sheer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>very</td>
</tr>
</tbody>
</table>

(5) adjectives functioning exclusively as 'predicative'

<table>
<thead>
<tr>
<th>a-</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>aflame</td>
<td>unable</td>
</tr>
<tr>
<td>afloat</td>
<td>well</td>
</tr>
<tr>
<td>afraid</td>
<td>wont</td>
</tr>
<tr>
<td>ajar</td>
<td>worth</td>
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<tr>
<td>alike</td>
<td></td>
</tr>
<tr>
<td>alive</td>
<td></td>
</tr>
<tr>
<td>alone</td>
<td></td>
</tr>
<tr>
<td>aloof</td>
<td></td>
</tr>
<tr>
<td>ashamed</td>
<td></td>
</tr>
<tr>
<td>asleep</td>
<td></td>
</tr>
<tr>
<td>aware</td>
<td></td>
</tr>
</tbody>
</table>

3.2. Problem II

Competent speakers of English intuitively know that a number of adjectives can be added as modifiers to a noun. In the manifestation of this knowledge of premodification, two prominent cases are observed: (i) a limited number of adjectives occur in a hierarchically ordered man-
ner in premodifying position, and (ii) any number of adjectives of the same type can be placed successively as modifiers to a noun. Observe the following examples.

(6) a. a tiny green ugly lizard
   b. the old, old, old, old man

As the following examples illustrate, additional number of adjectives can be added to modify a noun.

(7) a. the first three tiny young green ugly grass-eating lizards
   b. a dirty, dirty, dirty, dirty, dirty, dirty T-shirt

   In the case of premodification such as (6a) and (7a), the hierarchical order of adjectives involved is prerequisite. This is substantiated by the following examples.

(8) a. the ugly green young tiny first three grass-eating lizards
   b. the young tiny ugly grass-eating green three first lizards
   c. the green young three tiny first ugly grass-eating lizards

One interpretation of the hierarchical order imposed on the premodifying adjectives is given below.\(^2\) The premodification under consideration can be taken as a process of narrowing the focus down to the head noun.

(9) \[
\text{Narrowing Down Process} \quad \Rightarrow \\
\text{DET} \quad \text{Ordinal} \quad \text{Quantity} \quad \text{Size/} \quad \text{Age} \quad \text{Color} \quad \text{Parti-} \\
\text{Number} \quad \text{Length/} \quad \text{Shape} \quad \text{Prove-} \\
\text{HEAD. N} \quad \text{ciple} \quad \text{nance} \\
\]

\[
\text{the last five little old golden glittering Incan idols} \\
\]

Let us now consider how Problem I and Problem II can be handled within the framework of a generative linguistics approach and Recursive Categorical Syntax analysis.

### 4. Generative Linguistics Approach

Within a generative linguistics approach, we can think of at least two routes towards the problem of exceptional adjectives listed in the tables (4) and (5). One alternative is to assume some sort of constraint imposed
on strings of words at the surface level. Such a device would operate to rule out the exceptional 'attributive'-only adjectives in predicative environment, and at the same time prevent the exceptional 'predicative'-only adjectives from occurring in premodifying position.

The other alternative is to employ strict sub-categorization features and extend their application to adjectives as well. In that case, the adjectives of (4) would be sub-categorized to select N as shown in (10), whereas the adjectives of (5) would be specified to occur after V as pictured in (11).

(10) [elder; A, _ N]
    [former; A, _ N]
    [inner; A, _ N]
    .
    .
    [very; A, _ N]

(11) [aflame; A, V _]
    [afloat; A, V _]
    [afraid; A, V _]
    .
    .
    [worth; A, V _]

The nonexceptional adjectives, i.e. those which can occur either as 'attributive' or 'predicative', would be sub-categorized as in (12), where the brace notation indicates that the lexical item can occur either before N or after V.
It does not require a close examination to see that the second alternative is not descriptively adequate. The examples in (13) suffice to invalidate the specification of (10) since the samples show that the double-underlined adjectives in question are not immediately followed by N.

(13) a. the former good-for-nothing grammar book
    b. the uppermost golden tile
    c. an expensive sheer silk veil

It is conceivable that the above inadequacy is not peculiar to (10) alone. The same may be said of the other specifications (11) and (12).

Turning now to the first alternative, it is technically difficult to formalize the proposed constraint. Even if it were formalized, however, it would still be regarded as an ad hoc rule imposed on surface structures.

A partial solution for Problem II can be obtained by incorporating the X-bar convention (14) 3 together with the phrasal expansion N′′⋯⋯ > (DET) (A′′) N′.

(14) X′′⋯⋯ >...X′⋯⋯ (where m=n, or n−1)

With these developments, (7a) and (7b) are now base-generated as in (15a) and (15b), respectively.
The above solution is indeed incomplete in the sense that the rule (14) and the phrasal expansion provide only the means for base-generating possible premodification structures: there is nothing in the system to rule out the anomalous examples of (8). Some mechanism has to be invented to account for the hierarchical order imposed on premodifying adjectives such as the one exemplified in (9). Another problem is that the phrasal expansion $N'' \cdots (DET) (A'') \ N'$ is insufficient since it gives rise to anomalous determinerless phrases. This point is discussed in detail in the next section.
5. Recursive Categorical Syntax Approach

The theory of Recursive Categorical Syntax requires, in principle, that each lexical item in the lexicon be specified in such a way that its phonetic (or orthographic) word, intrinsic category, and argument category if it selects any are all established. For example, a determiner *the* and a noun *lizard* are specified as in (16a) and (16b), respectively. For expository purposes, the arrows are utilized to indicate the designated items and categories.

(16) a. \(<\text{the}, \ D, \ N>\)

\[
\begin{array}{ccc}
\uparrow & \uparrow & \uparrow \\
\text{phonetic} & \text{intrinsic} & \text{argument} \\
\text{word} & \text{category} & \text{category}
\end{array}
\]

b. \(<\text{lizard}, \ N>\)

Unlike *lizard*, which is a nullary word with no argument category, *the* takes a noun as its argument, hence the argument category N as shown in the above specification (16a).

In essence, we induce phrases by combining lexical items. A phrase *the lizard*, for example, can be generated by uniting the above two lexical items (16a) and (16b). This concatenation of lexical items is achieved by making use of a mechanism called Word Induction given below.

(17) Induced Lexicon (Brame, 1985: Def. 2.3)

Def. LEX is the smallest set satisfying the following conditions.

(i) If $L_i \in \text{LEX}$, then $L_i \in \text{LEX}$.

(ii) If $L_i^n = (x, \phi, \psi_1, \ldots, \psi_n) \in \text{LEX}$ and $L_j^m = (y, \psi_1\sigma, \theta_1, \ldots, \theta_m) \in \text{LEX}$, for $n \geq 1, m \geq 0$, then $(x-y, \phi\psi_1\sigma, \theta_1, \ldots, \theta_m, \psi_2, \ldots, \psi_n) \in \text{LEX}$.

The above linking device is activated to associate a lexical item with another if the argument category of one of the two lexical items and the intrinsic category of the other share the same type of category as shown by the association line in (18). By utilizing the above machinery we obtain the phrase as desired on the righthand side of the equal sign.
At this point a question immediately arises: Does this system account for premodifying adjectives such as in (6) and (7)? The answer is yes. But first, the details.

Conspicuously, we do not want to specify adjectives in general to select N as their argument. If we do, (i) the fact that a number of adjectives occur as modifiers to a noun cannot be accounted for, (ii) noun phrases consisting of determiner, adjective, and noun cannot be induced due to a superfluous, unidentified N, and (iii) 'predicative'-only adjectives cannot be accounted for since they do not select N as their argument. These observations force us to abandon the assumption that adjectives in general take N as their argument.

In light of the above results it seems to be plausible to (i) assume that adjectives are nullary words, hence they do not take an argument, and (ii) modify the lexical specification of the determiner. Consequently, (16a) is now replaced by (19).

\[(19) \langle \text{the}, D, A_0, N \rangle\]

Determiner the is now established as a binary word since it takes two arguments $A_0$ as the initial argument and N as the second argument. The subscript $A_0$ of the argument category $A_0$ is utilized here to indicate the minimum number of $A$ allowed as the initial argument. The maximum number of permissible $A$ can be specified and superscripted to $A$. But as we have observed, any number of adjectives can be added as modifiers to a noun: thus the maximal number of potential $A$ is left unspecified here.

The above assumption (i) is suggestive: Adjectives are indeed argumentless nullary words. This is the reason why they are selected by 'argument-takers,' such as a determiner the as illustrated in (19). The fact that 'predicative'-adjectives do not single out N as their arguments also follows from the above assumption. 'Predicative'-adjectives are instead selected out by verbs such as become, feel, sound, is, are, was, etc.. This motivates
the following specifications.

(20) \langle \text{become}, \text{V}, \text{A} \rangle \\
\langle \text{feel}, \text{V}, \text{A} \rangle \\
\langle \text{sound}, \text{V}, \text{A} \rangle \\
\ldots \\
\ldots \\
\ldots \\
\text{etc}

In connection with the above developments, consider now the following examples.

(21) a. \text{fanatic linguist}
    b. fanatic linguists (nongeneric)
    c. fanatic linguists (generic)
    d. a fanatic linguist (nongeneric)
    e. a fanatic linguist (generic)
    f. the fanatic linguist (nongeneric)
    g. the fanatic linguist (generic)
    h. the fanatic linguists (nongeneric)
    i. the fanatic linguists (generic)

Why is (21a) anomalous, while (21b) and (21c) are not? Our intuition tells us that (21a) lacks a determiner, whereas (21b) and (21c) have a 'zero determiner'. This observation leads us to the lexical specification of the 'zero determiner' given in (22). The 'zero determiner' is phonetically covert; thus the upper-case Greek \( \Lambda \), an identity element, is employed here. The second coordinate \( D^\varphi \) symbolizes the intrinsic category of the 'zero determiner'.

(22) \( \langle \Lambda, D^\varphi, A_0, N \rangle^4 \)

Given (22) and the lexical specification of the relevant items in (23), a well-formed example (21b) can be induced by making use of Word Induction (17) as shown in (24).
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(23) a. \langle fanatic, A \rangle 
    b. \langle linguists, N \rangle 

(24) a. \langle \Lambda, D^\phi, A_0, N \rangle (\langle fanatic, A \rangle) = \langle fanatic, D^\phi A, N \rangle^5 
    b. \langle fanatic, D^\phi A, N \rangle (\langle linguists, N \rangle) = \langle fanatic-linguists, D^\phi AN \rangle 

The anomalous example (21a) on the other hand, cannot be induced in our system due to the fact that the conditions for activating Word Induction are not satisfied. Specifically since (21a) lacks a determiner, no 'argument-taker' is available. For this reason the relevant lexical items \langle fanatic, A \rangle and \langle linguist, N \rangle cannot be combined; thus the anomaly results.

The above discussions show that Recursive Categorical Syntax approach is efficient: Both cases of premodification (6) and (7) can be induced in the system. The specifications (19) and (22) capture the essence of premodification: (i) a determiner is the head of premodification and N is the premodifiee, the focus or the center of premodification, (ii) a number of adjectives can be combined and placed between D and N.

We still have to face the remaining problem: How do we prevent 'attributive'-only adjectives from occurring in predicate environment, and at the same time rule out 'predicative'-only adjectives from appearing in premodifying position? Note here that we want our generalization that adjectives are nullary words intact and in force. The exceptional adjectives of (4) and (5) are highly idiosyncratic, thus they should be handled as marked cases. But how do we ensure that these exceptional adjectives occur in appropriate environments? One possible solution is to assume that 'attributive'-only adjectives carry the feature \ [+ attributive, - predicative], while 'predicative'-only adjectives bear the feature \ [- attributive, + predicative]. Thus we specify the relevant adjectives accordingly as in (25) and (26) below.
Due to the above specifications, each of the exceptional adjectives in question is now restricted to occur only in appropriate environment.
Alternatively, we may employ diacritics, such as \( \text{att} \) for 'attributive'-only adjectives and \( \text{pre} \) for 'predicative'-only adjectives. In that case the intrinsic category of the former type of adjectives is specified as \( \text{att}A \) and that of the latter type is indicated as \( \text{pre}A \).

7. Concluding Remarks

We have seen that Problem I and II are not adequately handled in the generative linguistics approach. Though the solutions we have put forward based on Recursive Categorical Syntax are not conclusive, they are practical. In our search for the solutions to the problems, important generalizations have been captured. They are: (i) English adjectives are nullary words and thus do not take an argument, and (ii) The key to the premodification we have dealt with is the determiners which take both \( A_0 \) and \( N \) as their arguments. It follows from these results that determinerless noun phrases are deviant. In the framework of our Recursive Categorical Syntax approach, determinerless noun phrases with respect to premodification are not induced due to the lexical specification of adjectives and the conditions of Word Induction. At the present state, however, the deviant examples of (8) are not accounted for without the help of the restriction (9) regulating the hierarchical order of premodifying adjectives. We wish to incorporate such a restriction into our system. But the problem is how? We leave the matter open, noting only that the question needs to be considered in greater depth.

**FOOTNOTES**

*I am grateful to Carol Rinnert for her suggestions and stylistic considerations on an earlier version of this paper.

1) The samples are taken from Seibido's Dictionary of English Linguistics.
2) See Quark, et al (1972: 925) for a similar analysis.
3) The formula is taken from Radford (1981: 104)
4) The specifications (19) and (22) imply the existence of \( \langle a, D, A_0, N \rangle \), of course.
5) Strictly speaking, \( A \) in \( D^* A \) should be replaced by \( A_1 \) since the minimum number of permissible adjectives is now established as 1 as the result of the concatenation.

REFERENCES