REVIEW ARTICLE


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This book is an extension of the authors' earlier work, especially, Williams' work on morphology. Di Sciullo and Williams (D and W)'s principal claim in this book is that there is a strict demarcation between morphology and syntax (although a small channel is still available). Central to this claim are the two notions of word. The one is the notion of word as morphological object, and the other that of word as syntactic atom.¹ The main task of morphology is to determine the laws and rules of word formation that define the set of morphological objects.² The syntactic atoms are the primes of syntax. Thus morphology generates a different set of objects than the set that syntax generates, and the principles of formation and the vocabulary of the systems of morphology and syntax are distinct (although they partly overlap). We may mention here one immediate consequence of this view:

'the lexicalist hypothesis ... is not a principle of grammar but rather a consequence of the conception that grammar contains two subparts, with different atoms and different rules of formation.' (2)

Thus the principle is a natural consequence of the architecture of grammar itself which dictates that the word as morphological object is syntactically opaque.

The strict separation of morphology and syntax naturally leaves little (if any) room for the interpenetration of the two systems (although it is not completely impossible). It is, however, true that the two theories,

* I wish to thank Takayasu Namiki and Noriko Imanishi for reading an earlier draft of this review. I am also grateful to Jeffrey Jones for correcting stylistic errors.
¹ There is a third notion of word: the notion of word as listeme (listed unit of language). See Chap. 1.
² Including the mechanisms that determine the features and argument structures of derived words (Chap. 2). See Roeper 1987; Randall 1988 for discussion and alternative approaches.
although demarcated, share a small theoretical vocabulary, including the argument structure and the categorial features. Thus the interpenetration or interaction, if possible, is restricted to whatever information can be passed through this narrow channel of shared vocabulary. It is, however, not the case that any (imaginable) interpenetration is possible. It is, D and W claim, limited to the following:

'although syntactic rules can access the categorial status and argument structure of a lexical item, they will never depend on how that categorial status or argument structure was arrived at through morphological derivation or on the internal constituency of words. The rules of syntax can see that a word has such and such properties, but they cannot see how it came to have those properties.' (48)

In other words:

'rules of syntax do not have access to the parts of words directly, only to the “topmost” properties of word: the features and argument structure of the topmost word.' (45)

For example:

'Syntax determines the distribution in sentences of such objects as “plural Ns”; morphology determines the form of such objects as “plural Ns,” and this is as far as the interpenetration goes. Syntax cannot tell, for example, how a plural N came to be one from the morphological point of view or how a word came to have any of the properties that it has.' (78)

The word is thus in a sense a bottleneck in the passage of information from morphology to syntax. D and W claim that this bottleneck is exactly wide enough from an empirical point of view.

This is a rough picture of the core system that they propose. Several consequences will follow from this view of the grammar. For example, Baker’s Mirror Principle and the system of Incorporation (cf. Baker 1985a, 1985b, 1988) must be rejected.³ No syntactic rules are permissible which alter argument structures. And there must be no principled distinction between inflectional and derivational affixes.

Beyond this core system, the border line between morphology and syntax begins to blur. D and W discuss two interesting cases. The first case is the syntactic words exemplified by expressions like essui-glace

³ For Baker's views against these remarks, see, especially, Baker 1988: §2.2.5.
'windshield wiper'. They are reanalyzed phrases which are $X_0$'s and exhibit syntactic atomicity. A marked rule like $N \to XP$ is in charge of generating those syntactic words. The second is a phenomenon called COANALYSIS. In the framework of separation of morphology and syntax, a coanalyzed structure becomes possible only in a circumscribed situation where the affix is syntactically adjoined to the entire phrase and morphologically added to its head SIMULTANEOUSLY. See the multidimensional tree structures in 1:

\[
\begin{array}{c}
(1) \\
(\text{i})
\end{array}
\]

\[
\begin{array}{c}
Y \\
X' \\
X \\
\ldots \\
af \\
X \\
X'
\end{array}
\]

\[
\begin{array}{c}
(\text{ii})
\end{array}
\]

\[
\begin{array}{c}
Y \\
X' \\
X \\
af \\
\ldots \\
X \\
X'
\end{array}
\]

In both cases, the affix is adjoined to the phrase $(X')$ to give $Y$ (the top structure) and affixed to the head $(X)$ to give $X$ (the bottom structure). In short, coanalysis is due to the structural ambiguity of affixation. Notice that both the top and the bottom structures of coanalysis must be independently well-formed in the grammar and that they must both respect the atomicity thesis. The top structure is PURELY syntactic and the bottom one involves PURE morphology (affixation, in principle). Only when the two structures are viewed together does the problem of the interpenetration of morphology and syntax emerge.

This is D and W's principal claim concerning coanalysis, which is quite natural and fairly plausible from their viewpoint of morphology and syntax. In the rest of this review article, we will discuss inadequacies of this claim, suggest an alternative, and consider its implications for their theory of separation of morphology and syntax.

1. First of all, we will give, as a starting point, the following general definition of a coanalyzed structure:\footnote{Defining a coanalyzed structure as in 2, we leave out the problems of coordinate structures which involve some (partly) different terminal strings and the phenomena examined in Manzini 1983 in which the terminal strings involved are not necessarily identical.}
(2) If a single terminal string SIMULTANEOUSLY possesses two different constituent structures and both of them are relevant to the principles/rules of grammar, then they constitute a coanalyzed structure.

Suppose, for example, that the terminal string abc has both a structure like 3 and one like 4 simultaneously:

(3)  
```
    A
   / \  
  B   C
  / \  
 a   b
```

(4)  
```
    A
   /  
  B   E
   / 
 a   c
```

In a case like this we say that the string abc has a coanalyzed structure like 5, here represented by a multidimensional tree:

(5)  
```
    A
   /  
  B   C
   /  
 a   b
   /  
 D   E
  /  
 D   E
```

Comparing the multidimensional tree in 5 with D and W's lii and the one in 6 with their li, we can interpret their claim regarding coanalysis as maintaining that B in 5 must be a prefix and that C in 6 must be a suffix:

(6)  
```
    A
   /  
  B   C
   /  
 D   E
  /  
 a   b
   /  
 E   C
  /  
 D   F
```

This hypothesis based on affixation we will call the **AFFIX THEORY OF CO-ANALYSIS** from now on. As noted above, the affix theory of coanalysis is quite a reasonable and a natural hypothesis from D and W's viewpoint of morphology and syntax.

In fact, there are five phenomena which support this affix theory of coanalysis. (The first four are discussed in the text, too.)

First, it has been argued that a Romance causative construction like 7 has a coanalyzed structure like 8:

(7) Juan hizo arreglar el carro a María.
    'Juan made Maria fix the car.'

(8) One of the arguments for the necessity of coanalysis in this case comes from Case-assignment at S-structure. In 9, the clitic *le* is assigned dative case and *lo* accusative case:

(9) María *le* hizo comerlo.
    'Maria made him eat it.'

This is because the former is Case-assigned by the complex verb $V_0$ *hizo comer* which appears only in the bottom structure and the latter by the independent embedded verb *comer* which shows up only in the top structure. Hence both structures must exist simultaneously. Strictly speaking, the causative verb *hacer* is not an affix, but it is not unreasonable to consider that it functions as a verbal affixal element, working as the non-head of a complex verb ($V_0$), in the bottom structure of 8.\(^5\)  

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\(^5\) The structure in 8 does not completely fit lii above. We will focus on whether the **AFFIX** is involved in the coanalyzed structure.
Second, it has been proposed that a restructured construction like (10) containing a restructuring verb like *querer* 'want' possesses a coanalyzed structure like (11):

(10) Juan quiere comer el pan.
    'Juan wants to eat the bread.'

(11)

One of the pieces of evidence for the existence of dual analysis is this: in the sentence in (12), on the one hand, there must exist a complex verb \( V_0 \), since there occurs clitic climbing (the bottom structure). On the other hand, the restructuring verb *tener* in the matrix sentence must take a sentential complement as well, since the complementizer *que* appears in the sentence in question (the top structure):

(12) Pedro lo tiene que leer.
    'Pedro has to read it.'

Thus coanalysis is needed. As has been the case with the causative construction discussed above, it will be plausible to claim that restructuring verbs like *querer* and *tener* function as affixal elements in the bottom structure. Cf. Rizzi 1982, Goodall 1987, and Napoli 1981.

Third, we turn to the English possessive. It is argued that it has a coanalyzed structure like (13):
In 13, the possessive marker -'s, functioning as an affix, is adjoined to the noun phrase as a whole and is affixed to its head noun simultaneously. This coanalyzed structure, D and W claim, accounts for the differences in acceptability among the following three expressions:

\textbf{(14)}  
\begin{enumerate}
\item [a.] [the man]'s hat
\item [b.] *(the man on the corner)'s hat
\item [c.] *[the man's on the corner] hat
\end{enumerate}

The expression in 14a is grammatical, but 14b is odd-sounding and 14c is completely ungrammatical. In 14a, the possessive -'s correctly has a coanalyzed structure, since both its adjunction to the entire phrase and its affixation to the head noun are rightly done. In 14b, however, the affixation of -'s to the head, which should correspond to the morphological bottom structure, is not carried out. And in 14c, the syntactic adjunction of -'s to the whole phrase, which would yield the syntactic top structure, is not done. This is the case in which the genitive -'s participates in the coanalysis, functioning as an inflectional ending.

Fourth, it is known that certain verbal suffixes nominalize a whole sentence in Quechua and Hopi. Take a sentence in Quechua like 15 for example:

\textbf{(15)}  
\begin{verbatim}
[ s xwan -φ papa -ta mikhu -sqa] -n -ta
Juan NOM potato ACC eat Noun/suffix 3 ACC
yacha ni
know I
‘I know that Juan eats potatoes.’
\end{verbatim}

\footnote{For Quechua, see Lefebvre and Muysken 1988.}
The fact that the entire embedded S is assigned accusative case (ta) shows that the suffix -sqa nominalizes it, operating as a nominalizer. Notice also that the -sqa in question simultaneously functions as a verbal suffix and that the suffixed verb mikhu-sqa assigns nominative case to its subject (xwan-φ) and accusative case to its object (papa-ta). This leads to the postulation of a coanalyzed structure like 16:

(16)

The properties of the element -sqa as a nominalizer are accounted for by the top structure, and those of -sqa as a verbal suffix by the bottom structure, respectively. As has already been clearly seen, the affix -sqa takes part in the coanalysis.

Fifth, it has been argued by Haegeman and Riemsdijk 1986 that in Dutch and German a certain class of verbs trigger clause union and that sentences containing those verbs have coanalyzed structures. A sentence like 17 in Dutch, for example, is coanalyzed as in 18:

(17) Jan en hus kopen wilt.
    ‘Jan wants to buy a house.’
It has been noticed that the scope relation between NP₁ *en hus* and \( V_M \) *wilt* is ambiguous in 17. Thus the non-specific interpretation in which *wilt* has wider scope than *en hus* and the specific one in which *en hus* takes wider scope than *wilt* are both possible. The coanalyzed structure in 18, according to Haegeman and Riemsdijk, can correctly explain this relative scope relation, because the former interpretation is given by the top dimension where \( V_M \) *c*-commands NP₁ and the latter by the bottom one where NP₁ *c*-commands \( V_M \). This yields evidence for coanalysis. It is again reasonable to regard \( V_M \) *wilt* as functioning as an affixal element in the bottom structure. This will be in accord with their remark that 'it has the properties of a bound morpheme.'

In sum, all of the five coanalyzed structures that we have reviewed in this section are those in which an affix (or an affixal element) is crucially involved: i.e., it triggers coanalysis. Thus as far as these coanalyzed structures are concerned, the affix theory of coanalysis is correct.

2. In this section we will discuss two counterexamples to the affix theory of coanalysis and suggest an alternative.

2.1. We will first take up *tough* constructions. According to Chomsky 1981, 1982, a *tough* construction like 19 is derived through the stages illustrated in 20:

(19) John is easy to please.

(20) a. \( e \) is \([AP \text{ easy } [S' \text{ COMP } [S \text{ PRO to please } O]]]\)
b. \( e \) is \([AP \text{ easy } [S' \text{ O, } [S \text{ PRO to please } t_i]]]\)
c.  \( e \) is \([\text{AP} [\text{A easy O, PRO to please}] t_i]\)  
d.  John is \([\text{AP} [\text{A easy O, PRO to please}] t_i]\)

The structure in 20a is a D-structure. Because the subject position \( e \) is a \( \tilde{\theta} \)-position, the insertion of lexical elements into this position is not done until the level of S-structure (cf. 20d). At the next stage, \( O \), a null operator, moves into COMP, which yields 20b. Following this stage, reanalysis takes place and makes the string \textit{easy to please} a complex adjective, yielding 20c. Finally, \textit{John} is inserted into the subject position. Notice that the \( \theta \)-criterion is satisfied both at D-structure and at S-structure.

It should be noted that the trace \( t_i \) in 20d is in effect an NP trace and thus an A-bound trace, since \( O_i \), which is contained in the lexical category A, no longer functions as an operator. This trace, however, must be an A-bound trace, because it licenses a parasitic gap as in 21:

\[(21) \text{The book is hard to buy t without reading e.}\]

This problem can be solved by assuming that a \textit{tough} construction has an original structure (cf. 20b) as well as a reanalyzed structure (cf. 20c (= 20d)) at the level of S-structure: i.e., that it has a coanalyzed structure like 22:

\[(22)\]  

\begin{center}
\begin{tikzpicture}
  \node (S) {S}
  \node (NP) [below left of=S] {NP}
  \node (VP) [below right of=S] {VP}
  \node (V) [below left of=NP] {V}
  \node (AP) [below right of=NP] {AP}
  \node (A) [below right of=VP] {A}
  \node (COMP) [below right of=AP] {COMP}
  \node (S') [below right of=NP] {S'}
  \node (NP') [below right of=S'] {NP}
  \node (VP') [below right of=NP'] {VP}
  \node (V') [below right of=NP'] {V}
  \node (A') [below right of=VP'] {A}
  \node (AP') [below right of=NP'] {AP}
  \node (S''') [below right of=NP'] {S'''}
  \node (S''') [below right of=NP'] {S'''}
  \node (t) [below right of=VP'] {t_i}
  \node (e) [below right of=AP] {easy}
  \node (O) [below right of=NP] {O_i}
  \node (PRO) [below right of=AP] {PRO}
  \node (v) [below right of=VP] {V}
  \node (np) [below right of=VP] {NP}
  \node (john) [below right of=NP] {John_i}

  \draw (S) -- (NP) -- (V) -- (A) -- (COMP) -- (S') -- (NP') -- (VP') -- (V') -- (A') -- (AP) -- (S''') -- (NP) -- (VP) -- (V) -- (A) -- (AP) -- (S)
  \draw (S') -- (V') -- (A') -- (AP') -- (S''')
  \draw (john) -- (e) -- (O) -- (PRO) -- (v) -- (np) -- (t)
\end{tikzpicture}
\end{center}

In the top structure \( t_i \) is bound by \( O_i \) and thus is an A-bound trace, and in
the bottom structure the subject John is correctly assigned a $\theta$-role.\(^7\)

If the above analysis of the tough construction is correct (cf. Levine 1984), then it cannot be covered by the affix theory, since no elements in A can be regarded as an affix.

2.2. The next argument concerns pseudo-partitive expressions like 23:

(23) a bunch of flowers, a number of books

It is already fairly well known that these pseudo-partitive expressions have a structure like 24:

(24) \([\text{NP } \{Q(P) \text{ a bunch of} \text{ flowers}\}]\)

One piece of evidence comes from the following paradigm:

(25) a. *Not the capital of the nation was bombed.
   b. Not \([Q_P \text{ many}] \text{ students showed up.}\)
   c. Not \([Q_P \text{ a vestige of}] \text{ evidence was found.}\)

This paradigm is easily explained if we assume that a vestige of has the same categorial status as many: i.e. QP. For details, see Kajita 1977. As we will argue just below, these pseudo-partitive expressions must also have a normal NP structure like 26 in which elements like bunch and number constitute its head:

(26) \([\text{NP } \text{Det N } \{\text{PP P NP}\}]\)

Thus pseudo-partitive expressions like 23 must be assigned a coanalyzed structure which has the structure in 24 and the one in 26 simultaneously:

(27)

\[
\begin{align*}
\text{Det} & \quad \text{NP} \\
\quad \text{N} & \quad \text{N'} \\
\quad \text{PP} & \quad \text{P} \\
\text{a bunch of} & \quad \phi \\
\text{Det} & \quad \text{NP} \\
\text{Det} & \quad \text{N} \\
\text{QP} & \quad \text{NP}
\end{align*}
\]

\(^7\) Cf. also Goodall 1985.
The following syntactic facts support the assumption that the pseudo-partitive expression in question has the structure in 26, i.e. the top structure in 27, as well.

First, observe 28, in which deletion applies to pseudo-partitive expressions:

(28) a. So the reduction from large numbers of transformations to small numbers, maybe one transformation, is progress if the theory of grammars doesn’t enrich variety in some other way. (Ike-uchi 1986: 106)

b. “Vote!” a bunch of girls said. “It’s a democracy.” Eva Wirtz said she withdrew her nomination of the piano, she was in favor of the painting. A bunch of girls clapped, a larger bunch now; the tide was moving toward Miss Falconer in oil. (Ike-uchi 1988a)

The strings of transformations and of girls are deleted in 28a and 28b, respectively. If the italicized pseudo-partitive expressions had only the bottom structure in 27, then we would have to insist that non-constituents be deleted and the deletion intrude into a single word (Q) and thus would have to admit that 28 is quite a strange phenomenon. Coanalysis can solve this problem easily. A coanalyzed pseudo-partitive expression has the top structure in 27, too. Assuming that the deletion rule is sensitive to it, we can succinctly account for these deletion facts in the same manner as the deletion in a normal NP: i.e. as the deletion of a PP constituent.

Second, movement facts give us another piece of evidence for the existence of the top structure. Consider 29:

(29) ‘Yeah, recreation, you’ll get [plenty of t],’ Jimbo grinned. (Ike-uchi 1988a)

This fact could not be explained if only the bottom structure were available. It should be emphasized that it can be regarded as the usual extrac-

Notice that it is necessary to assume that the binding theory (C) applies only to the bottom structure, since in the top structure the A-bound trace t; is also A-bound by NP,(John), which would yield a binding theory violation. Cf. Lasnik and Uriagereka 1988: 147. Notice furthermore that the Į-criterion as well must apply only to the bottom structure.

The following alternative account of 28 might be possible. Let us assume that N’ deletion, which is considered to apply in (i) below, is sensitive to the bottom structure:

( i ) Many buildings were damaged, but few were destroyed.

Then it first derives, for example, the string a bunch of. At the next stage, of as a subordinator is suppressed (cf. Kajita 1977), which yields the string a bunch.
tion of NP from PP if the movement rule applies to the top structure.\(^9\)

Thus, there is strong evidence for coanalysis of the pseudo-partitive expression.\(^{10}\) Notice that there exist no affixal elements in this case, either.

2.3. In this subsection we will suggest an alternative hypothesis which subsumes all the coanalyzed structures discussed so far. It could be said that the affix theory of coanalysis pays attention to the node B in the multidimensional tree in 5 and the node C in 6, and places on them the restriction that they must be an affix. But we would here like to take notice of not the node B or C, but the node F. To give it a more precise definition, we set up multidimensional trees like 30 and 31 (by generalizing those in 5 and 6) which we will refer to as the canonical multidimensional trees:

\[(30)\]

...
And we pick up the node F in 30 and 31. Then we readily notice that F is V, N, A, or Q in the coanalyzed structures discussed above. Thus our new hypothesis is 32:

(32) In the canonical multidimensional tree (30 or 31) representing a coanalyzed structure, the node F must be an X₀.

What 32 maintains is that a coanalyzed structure like 33 in which F is an XP or I does not exist in the natural language:

(33)

Thus 32 is suggested as a step towards a theory of possible coanalysis.

11 We think that the functional categories C and I should be excluded. That will be achieved if we change an X₀ in 32 into a lexical category (e.g. [±N, ±V]₀), assuming that Q is (quasi-)lexical.
12 See footnote 11.
13 It would be possible and necessary to put some restrictions on the internal structure of F. For example:
3. Let us consider some implications of our new theory of coanalysis for D and W's theory of morphology and syntax.

Coanalysis is in a sense an interface between morphology and syntax from their standpoint, since a coanalyzed structure based on their affix theory, as a whole, expresses the intermingling of morphology and syntax, although the top structure itself is purely syntactic and the bottom one involves pure morphology—each structure observes the atomicity thesis. Our discussion in the preceding section reveals that the bottom structure of coanalysis does not necessarily contain pure morphology involving affixation, as is claimed by D and W. Recall the tough constructions and pseudo-partitive NP's argued above. Thus the bottom structure by itself includes the interpenetration of morphology and syntax. It will surely be related to reanalysis (§3.3.). This of course is not immediately damaging to their theory of demarcation of morphology and syntax, which is quite interesting in that it is restrictive in its descriptive power. It is, however, worth emphasizing that coanalysis will doubly be deviated from their theory of morphology and syntax and that there are also the cases of intermingling: the syntactic words mentioned above, reanalysis, and relatedness phenomena (§3.8.). Thus we cannot help indicating that the restrictiveness of their theory of morphology and syntax crucially depends on how these processes are dealt with and where they belong to, core or periphery, as is also touched on by D and W.

REFERENCES


(i) the categories BX ... YD and EY ... XC must be adjacent.
And:
(ii) There is an upper limit on the number of categories contained in F.
(iii) There are some restrictions on the kinds of categories contained in F. For (ii), it could be argued that the structure in which X ... Y do not exist, i.e., the number of categories included in F is two, is most unmarked. These considerations will lead us to notice that D and W's affix theory of coanalysis is one of the possible hypotheses concerning (iii).

For some residual problems, see Ike-uchi 1988b. See also Baker 1985b, 1988; Koster 1987 for some arguments against coanalysis.
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