Endocentric and Exocentric Structures

Introduction

To make a diagrammatical analysis on endocentric and exocentric structures, Nida's diagrams are used as a base. The procedure in this paper is roughly: in chapter I, two diagrams \[ \text{L~J} \] and \[ \text{L~J} \] in E. Nida, *A Synopsis of English Syntax* (1951, 1960) are revised to \[ \text{A/B} \] and \[ \text{A/B} \] according to the definition of endocentric and exocentric structures by Bloomfield; in chap. II, the endocentric structure is studied in reference to H. Greenberg's definition of modification and Jespersen's idea of ranks and a hypothesis is made that the structure of subordination is founded purely on the configurative aspect of language; in chap. III, the discussion of endocentric structure formerly debated on syntactic level is developed to the domain of morphology through E. Sapir's formula, it is stated that as far as the diagrammatical study is concerned morphology and syntax should be studied in the same category, and it is postulated that the configurative aspect of endocentric structure is independent of the semantic aspect projected on the structure; in chap. IV, a research is made on exocentric structure, of which prominent difference from endocentric structure is the indivisibility of meaning and form; in chap. V, Nida's diagram for the description of co-ordinate endocentric structure is revised to diagram (5); in chap. VI, diagrams (1), (2), (3), (5) contrived in this paper are applied for the actual analysis of English and Japanese; in chap. VII, the problem of the difference between morphology and syntax is reconsidered, especially as to the difficulty in the application of syntactically contrived diagrams to the analysis of the morphological aspect of language.

I. Diagrammatizing of Endocentric and Exocentric Structures

The terms “endocentric” and “exocentric” are found in L. Bloomfield, *Language*, where the two conceptions are defined, on the principle of IC (immediate constituent) analysis, as follows:

Every syntactic construction shows us two (or sometimes more) free forms combined in a phrase, which we may call the resultant phrase. The resultant phrase may belong to a form-class other than that of any constituent. For instance, *John ran* is neither a nominative expression (like *John*) nor a finite verb expression (like *ran*). Therefore we say that the English actor-action construction is ex-centric: the resultant phrase belongs to the form-class of no immediate constituent. On the other hand, the resultant phrase may belong to the same form-class as one (or more) of the constituents. For instance, *poor John* is a proper-noun expression, and so is the constituent *John*; the forms *John* and *poor John* have, on the whole, the same functions. Accordingly, we say that the English character-substance construction (as in *poor John, fresh milk*, and the like) is an endocentric construction.

Nida uses the diagram \[ \text{L~J} \] (the arrow points toward the head constituent) for indicating the endocentric structure, and
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For the exocentric one. If it is possible to call one kind of function in the structure of syntax provisionally as A, the other one as B, and still others as C, D, . . . ., the structure shown by \[ \text{structure} \] could be described by \[ A \rightarrow B \] (hereafter called diagram (1)), in which the construction may be explained, according to the definition by Bloomfield cited before, that the two functions A and B are combined and the combination as a whole makes the new function which is same to B. In the same way, the revised description of \[ \text{structure} \] will be given by \[ A \rightarrow C \] (diagram (3)), in which the combination of the two functions A and B has the new function C which is different from both A and B.

Through diagrams (1) and (3), several configurative characteristics of endocentric and exocentric structures are made clear, especially in reference to syntactic theories by grammarians other than Nida. In other words, the significance of those diagrams is that they stand between Nida's theory and several other grammarians', playing the role of intermediate link between them, and that they extract the general and common syntactical characteristics from both of them.

II. Endocentric Structure (in reference to J. H. Greenberg's definition of modification)

In the traditional grammar's method of parsing, the structure of so-called modifying and being modified may be regarded to be equal to what is expressed by (1).

The following statement is the definition of modification by Joseph H. Greenberg:

If a class x never appears in a subconstruction without another class y, while y occurs in some subconstruction without x, then x modifies y.\(^\text{1}\)

Replacing x and y to A and B respectively, it is possible to recognize, in the above statement, the same structure as described by (1).

Greenberg's definition is dependent on the contextual aspect of grammar. It may be possible, putting an emphasis on the context, to make the following new interpretation on diagram (1) and (3): as to the appearance of A and B in a certain definite context, it may be said that if the presentation of A and B is always in the form of combination, i.e., A + B, the situation is described by (3) and that if B or A + B appear in the same grammatical circumstance, the situation is described by (1).

Greenberg, further, extends the idea of modification to Jespersen's idea of ranks. According to his interpretation, the three ranks is "a construction in which A modifies B and B modifies C, as with noun, adjective, and adverb in English."\(^\text{2}\) It is clear that this construction, which may be illustrated as shown in diagram \[ A \rightarrow B \rightarrow C \], has the structure consisting of the duplication of pattern (1). This diagram enables us to realize that Jespersen's ranks consists of three-stage hierarchy of A, B, C and, at the same time, two-stage hierarchy of modification structures shown by (1).

The criterion Jespersen based on for the definition of ranks is the scheme of subordination between words; that is to say, which word specializes which word and which word is specialized by which word. One of the important problems as to this criterion is whether it is founded on the notion or on the form of language. Reading his introductory explication on the conception of ranks,\(^\text{3}\) I had an impression...
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that he relied rather on the notional aspect of language for establishing the idea. In this paper, however, it is necessary for asserting the validity of diagrams contrived in this paper, which are constructed, in their method and basic hypothesis, on the configurational aspect of language, to postulate that it is the form of language which decides the mutual relationship of subordination between words.

For example, as to the two expressions a bird and a blue bird between which the former is more inclusive and the latter is more definite, it seems possible to make an explication that the word blue specializes bird to distinguish blue bird from yellow bird, black bird, pretty bird, large bird, etc.; but, standing on a different viewpoint, it may also be possible to consider that bird specializes blue to distinguish blue bird from blue fish, blue table, blue sky, etc.

Generally speaking, in the combination of two notions of any kind, there would be no possibility, in a hypothetical condition that they are not supported by any grammatical structure, that one of the two notions specializes the other. This consideration is inevitable as long as a notion is given its function as a notion because, if one of the two notions specializes the other without any aid of configurationally defined grammatical structure and purely in the network of their notional category, the two notions would be destined to lose their functions as an individual notion.

III. Endocentric Structure (in reference to the formulas used in E. Sapir, Language)

One of the structural formulas shown in Sapir, Language (pp. 25–9), which symbolizes the word for example singer by $A + (b)^©$, may be regarded to be of the type same to (1). The formulas, as they are constructed on the level of morphology rather than on syntax, would make it possible to develop our preceding discussions on syntactic structures to the domain of morphology. The following quotation is his definition of formula $A + b$:

If we symbolize such a term as sing by the algebraic formula $A$ we shall have to symbolize such terms as sings and singer by the formula $A + b$. The element $A$ may be either a complete and independent word (sing) or the fundamental substance, the so-called root or stem or "radical element" (sing-) of a word. The element $b$ (-s, -ing -er) is the indicator of a subsidiary and, as a rule, a more abstract concept; in the widest sense of the word "form", it puts upon the fundamental concept a formal limitation. We may term it a "grammatical element" or affix.

Here it seems that Sapir makes a distinction of the notional element and the grammatical element in a word; the former contained in $A$ and the latter in $b$. It is interesting that the same can be true on the level of syntax also: for example, in a noun phrase, an article, which is always syntactically dependent, is called a grammatical word and the succeeding noun, of which role in syntax is radical, is called a notional word.

The above statement, however, is not true in most cases in syntactic structures. The diagrams on p.89 are several types of modifier-head constructions exemplified in H. A. Gleason, Linguistics and English Grammar.® Inspecting them, it is evident that all subordinating elements except an article are generally called notional words.

In the former chapter when Jespersen's idea of three ranks is
introduced in reference to the structure of modification, it is remarked
that the grammatical function of subordination is founded solely on the
form of a language. There would be those among readers who would
think that there is a contradiction between the present statement and
the preceding one. To avoid misunderstanding, further explication
should be added.

As a matter of fact there is a fundamental difference between the
fact that a language has two aspects, meaning and form, and the fact
that a language is a kind of configuratively structured physical existence.
Meaning does not exist in language as a physical substance but in the
relationship between language itself and universe (cf. the diagram be-
low left). In the famous diagram of basic triangle in Ogden & Richards,
The Meaning of Meaning (1923), for example, meaning is described as
an intermediate existence between language and thing in universe (cf.
the diagram below right).

The hypothesis in this paper may be repeated again for confor-
mation, in the next varied expression. It is that the structure of
subordination, i.e. endocentric structure, is hypothesized to be the two-
dimensional structure shown by diagram (1) and that what makes it
possible to describe the diagram may be considered to be founded
purely on the configurative aspect of language.

It may be possible to make another hypothesis for better under-
standing, though there is no way of proving it; that is, the process of
producing endocentric structure might be assumed to be consisting of
two individual steps: the one is the process in which the construction
as shown in (1) is produced by configuration, and in another process
a notional vocabulary and a grammatical one are distributed to B and
A respectively.

There are several other formulas than A + (b) in Sapir, Language.
Six fundamental types are: A (Nootka hamot); A + (o) (sing bone);
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A + (b) (singer singing) ; (A) + (b) (Latin hortus) ; A + B (fire-engine) ; A + b (beautiful).

Trying to examine those formulas in connection with diagrams (1) and (3), the author found that there lie so many different kinds of linguistic aspects interwoven between them and that the discrepancy between them is more profound than expected. For example, the analysis of the word beautiful exemplified for formula A + b, may have three results according to three different viewpoints. If it is considered that the radical part of the word is beauti- and the subsidiary part -ful as shown in the formula, the appropriate diagram may be (2); if part of speech is taken into consideration, the diagram may be (1) because beauty is a noun, full is an adjective, and the whole construction beautiful is an adjective; and if the orthography is born in mind, the difference between beauti- and beauty and -ful and full must be taken into account and the resultant diagram might be (3) because the whole construction and its two constituents are fundamentally different in their configuration.

Some readers would have thought that it is almost meaningless to continue the speculation. If a demarcation line between syntax and morphology can be drawn distinctly, all of the six various formulas by Spair, from a syntactical point of view, may have the same value and would be expressed equally by a single symbol. This might be possible as far as English is concerned, but would seem impossible when many other languages in the world are observed. Sometimes it is very hard to draw the demarcation line. And further, it must be remembered that the purpose of this chapter is to study syntax and morphology in the same category. What is significant in Sapir's formulas is that he developed them to the typological study of the whole languages in the world. Sapir himself does not make any distinction between Syntax and morphology in his formulas and, theoretically speaking, his formulas must be connected with syntactically constructed diagrams. It would be one of the future tasks left for linguists to find out a common base for what has been studied individually in syntax and morphology respectively.

IV. Exocentric Structure

According to the hypothesis presented in chap. II, the endocentric structure is a construction founded solely on configuration though it is characterized by both form and meaning of language. Now shifting the subject for discussion from endocentric to exocentric structure, the great difference between the two structures is that some of the exocentric structures cannot be said to be constructed solely on configuration. Borrowing the words on p. 90, it may be said that the two steps in which is consisting the process of producing the exocentric structure are not individual.

The most important exocentric structure might be the subject and predicate construction. In most European languages, we find the concord of cases, numbers, and genders, between subject and predicate. In chap. II, meaning was defined as the intermediate and relational existence between language and universe; and according to this definition, these concords must be a matter of meaning.

Subject and predicate are related to noun and verb respectively. Though they are distinguished in transformational grammar by calling the former two functional notions and the latter two categorial notions.
and they should actually be distinguished in any grammatical considerations, it is too evident a fact that they are deeply connected each other by the fact that the position of subject is occupied always by a noun or a noun phrase and that of predicate by a verb or a verb phrase.

Traditional grammarians' definition of noun and verb, though given poor estimation by structural linguists, is worth receiving an attention, especially in the present discussion of which subject is the indivisibility of form and meaning in the exocentric structure. It reflects the conceptions of space and time—two of the most important dimensional ideas in universe. By the way, the traditional grammarians' idea of connecting noun and verb to space and time can be found in Middle Ages already in such grammars as by Siger de Courtrai and Thomas of Erfurt.\(^{10}\)

Though the main purpose of this paper is to develop the configurative pattern of the linguistic structure and I refrain from discussing further on the exocentric structure, this structure, in which the relation between meaning and form is so complex and hard to be studied individually, may have more significant philosophical problems than the endocentric structure. It would be interesting to discuss the exocentric structure in connection with the idea of: apperception in association psychology, nexus in Jespersen's grammar, logical syntax, embedded sentence in transformational grammar, etc.

V. Co-ordinate Endocentric Structure

The diagrams \( \square \) and \( \square \) though most of the syntactic structures of English are described by these two, are not

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<table>
<thead>
<tr>
<th>Hypotactic</th>
<th>Exocentric</th>
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<td>Endocentric</td>
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<td>Co-ordinate</td>
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<td>Subordinate</td>
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<td>Paratactic</td>
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Now a discussion is going to be made on diagram \( \square \) of which explanation of the syntactic structure intended to express by Nida may be: the combination of the two functions of the same kind \( A \), as a whole, has the function same to \( A \); and it is possible to describe the situation by \( \thickspace \frac{A}{A} \), provided that the consideration same and parallel to the one made as to the two diagrams mentioned in chap. I are admitted. The actual usage of \( \square \) in Nida's book, however, shows that the structure by this diagram is founded on a somewhat different criterion. This diagram is used always in combination with \( \square \) and describes the structure consisting of three elements; i.e., two same elements and a conjunction linking them, as follows: \( \thickspace \frac{A}{A} \) (diagram 4).

There is an opinion\(^{20}\) that the combination of three elements appearing always together should not be described by the union of two kinds of diagrams of binary division but by a single diagram contrived for describing the combination of three elements solely; and if this consideration is accepted, the coordinate endocentric structure of
English may be described by the diagram as follows:  
\[
A \times A
\]  
(diagram 5).

It is clear that Nida used a rather redundant combined diagram for three elements structure by the reason that he, with his method founded on the idea of IC analysis, tried to be consistently binary in dividing every syntactic element. It is said, however, that the general characteristics of language cannot be made clear by the hypothesis of IC analysis method that every language consists of the hierarchical structure which can be analysed by the binary division method.

As another reason why Nida's binary division method is not profit-able for analysing the combination of three elements, it may be pointed out that there is no decisive reason for dividing three elements as shown by Nida in diagram (4). The following three various diagrams would also be possible:

\[
\begin{align*}
A & \text{ conj } A \\
A & \text{ conj } A \\
A & \text{ conj } A
\end{align*}
\]

(6) (7) (8)

From the viewpoint of chronological sequence, diagrams (7) and (8) seem to be more reasonable than (4) and (6) because in actuality the structure of coordination is realized with the appearance of conjunction linked with the first A and, even before the presentation of the second A, the coordination between the first A and the second A is necessarily expected and, in a sense, almost accomplished.

If, on the other hand, the phonetic aspect is taken into consideration, the more reasonable diagrams might be (4) and (8), because the position of pause usually comes between the first A and the conjunction, and the conjunction and the second A are pronounced in a unit.

In diagrams (4) and (7), the connection between the conjunction and the function A is shown by the signal of exocentric structure; and in diagrams (6) and (8), by the endocentric one. Again, it is difficult to decide which diagram to choose for explaining the structure. Consideration would be done in many ways by describing revised diagrams, such as:\[
A \quad B \quad A
\]
for diagram (8) and\[
A \quad C \quad A
\]
for (7); however, all that is certain in this structure is, as shown in the diagram\[
A_1 \quad \text{conj} \quad A_2
\]
the combination of A_1 conjunction, and A_2 makes the function of A_2 and the further hypothetical construction between A_1(A_2) and A_3 seems to have little meaning and unnecessary though it would of course be an inevitable result for Nida, who tried to keep consistently binary in his syntactic analysis.

VI. The application of diagrams (1), (2), (3), (5) to the analysis of syntactic structure

Though the endocentric and the exocentric structure are the very important two contrastive structures of language, all the aspects of syntax cannot be described by them; they are sometimes unprofitable as found in the case of three elements combination structure discussed before, and sometimes become the cause of disregarding very important aspects of language by treating some different syntactic structures in a same category.

Now as the next step for making the diagrams in this paper contrived from Nida's ones a more detailed linguistic analysis, provisional signals A, B, C, ... are replaced with abbreviated letters taken
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The syntactic patterns found in English may be shown by using diagrams (1), (2), (3), (5):

1. B A B
2. A B A
3. C B A
4. A A

Replacing provisional signals with N(noun), V(verb), Adj(adjective), Adv(adverb), art(article), prep(preposition), conj(conjunction), and S(sentence), the following more actual syntactic patterns of English will be gotten for each of the four diagrams above.

1' N N N V
2' v v v N
3' s Adj N N(s-Adj) N
4' N V Adj Adv

By the combination of these patterns, an English sentence can be analysed and diagramed as shown below. No reader would fail to notice the similarity between this diagram and the phrase-marker in transformational grammar though their theoretical backgrounds are quite different.

The syntactic patterns shown by (1), (2), (3), (5) may be generalized further to make them available for the study of linguistic universals. By synthesizing diagram (5), of which structure is rather peculiar among the four, with diagrams (1), (2), (3), the following eight syntactic patterns will be formalized:

1. B A B
2. A A A
3. C A B
4. A A A

By making an inference of a reversal way, the fundamental syntactic patterns of Japanese will be gotten by selecting three patterns from the diagrams above.

The more actual syntactic patterns of Japanese will be described by replacing labels at each node. Abbreviated signals taken from the terms of parts of speech are — N(noun), V(inflective word: verbs and adjectives), f(function word).

An example of Japanese, analysed by the synthetic use of three
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diagrams above may be:

![Diagram](image)

The diagrammatic analysis above contains left-branching and right-branching constructions. In the two recursive constructions, the left-branching one can be contrasted with the famous Chinese box style diagram called *Irikogata-structure* by Motoki Tokieda (cf. the diagram below left), but the right-branching one is not (cf. the diagram below right). The author takes the position to admit the existence of both left and right recursive constructions in Japanese.

Some of the readers might have thought that the analysis of the verb should more minutely be carried out. H. A. Gleason, in the book cited before, classifies the construction of a verb phrase into the category of exocentric structure. Following his classification, the more detailed diagrams on verbal elements would be described as shown below, where abbreviated terms are: Aux(auxiliary verb), Root, pres p(present participle), pp(past participle).

![Diagram](image)

English verb phrases are constructed with the very neat binary combinations of verbal elements; each combination containing one meaning. The diagram below, though not theoretically formalized, represents the structure of an English verb phrase in a well-ordered construction, where configurative aspect is shown in vertical balloons and meaning in horizontal balloons.

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V. The difference between morphology and syntax in a diagrammatic analysis

Before concluding the paper, one of the several problems in diagrammatic analyses which necessitate further study for solution, may be pointed out. It is the problem of the difference between morphology
The problem is that the diagrams constructed originally on the syntactical structure are not profitable for applying to the analysis of morphological aspect of language. The application may be possible but it would become too redundant.

When the formula $A + (b)$ was introduced in chap. III, the element $b$ was presented as an affix; however, as explained by Sapir, it need not always be an affixed element, but "it may be inserted into the body of the stem... or it may consist of some modification of the inner form of the stem (change of vowel, as in *sung* and *song*; change of consonant as in *dead* and *death*; change of accent; actual abbreviation)." In Arabic language, the shift of tense is expressed by the sound shift of interwoven vowels; i.e., *kataba* is the perfect tense form of the verb meaning "to write" and *yakutaba* (*ya* is prefix and *kutuba* is the radical element) is the imperfect tense of the same verb. How to describe the structure of those morphological constructions diagrammatically?

One of the reasons why I did not show the analysis of verbs and verbal phrases in a full scale but only supplementally added at the end of the preceding chapter is that, both in Japanese and English, verbal elements have a characteristic to present themselves always in a cluster and the shift of the verbal form seems akin to a morphological variation rather than a syntactical change. The diagrams in this paper would become so much redundant if applied for the description of verb phrases and it seems that there might be better diagrammatic method for the descriptions of verb phrases, such as slot-and-filler technique in the study of tagmemics.

As one of the ways for the solution it might be considered to refrain the application of syntactically contrived diagrams for the analysis of morphological aspect of language. The problem, however, is not so easy because it is difficult and sometimes impossible to make a distinction between morphology and syntax.

_Morpheme_ is the grammatical conception defined by structural linguists as the smallest linguistic unit at which meaning and form of language encounter in one-to-one relationship. Their plan of linguistic study was to develop this smallest unit to larger constructions and finally to the domain of semology. Though morpheme is defined clearly as a definite unit by structural linguists, it is a kind of an abstract conception of which concrete structure is perceived only though the set of allomorphs; so that if it is observed from the side of a syntactical point of view, its structure is not easily grasped sometimes.

To the author it seems that the difference between morphology and syntax is not a dimensional one, but that it is a matter of degree. Postulating that a certain configurative structure of a language is comprehended in a certain grammatical category: if the category is small, the configurative structure would be a matter of morphology, and if large, it may be regarded as a matter of syntax. And still, by the fact that some parts of speech are systematized in a larger category and some others, like verbs and verb phrases in English and Japanese, are in a smaller one, it seems better not to draw a distinct demarcation line between morphology and syntax; but, as stated in chapter III, to investigate the structure of both morphology and syntax in a same category.
Notes:

2. Endocentric structure may be described by \[ \begin{array}{c} A \\ \hline B \end{array} \] (diagram (2)) also. To avoid duplication in explanation, only one of the two diagrams will usually be shown and there is no other particular reason for selecting diagram (1).
5. For example, in *The Philosophy of Grammar*, p. 96 he writes, "In any composite denomination of a thing or person, . . . . , we always find that there is one word of supreme importance to which the others are joined as subordinates. This chief word is defined (qualified, modified) by another word, which in its turn may be defined (qualified, modified) by a third word, etc. We are thus led to establish different "ranks" of words according to their mutual relations as defined or defining. In the combination extremely hot weather the last word weather, which is evidently the chief idea, may be called primary; hot, which defines weather, secondary, and extremely, which defines hot, tertiary.
10. A, A2, and A3 are all same as a function. Each number is put only to indicate the positional difference and to make the succeeding explanation easy.
11. As an example of an English sentence, the author took the one used in Gleason, *ibid.*, pp. 138-158, where he uses it as a common example for explaining three different types of techniques of linguistic analyses: base-and-modifier technique, slot-and-filler technique, and IC (immediate constituent) technique.
12. Cf. 永谷静夫『冷語学の発見と発展』（東京女子大学学会）第四章.
15. 杉浦貞夫『分析の現象』（早稲田大学出版部）p. 13.