GENERATIVE GRAMMATICAL STUDIES

IN

THE JAPANESE LANGUAGE

by

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SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENT FOR THE

DEGREE OF DOCTOR OF

PHILOSOPHY

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June, 1965

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Department of Modern Languages, May 14, 1965

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Submitted to the Department of Modern Languages on May 14, 1965, in partial fulfillment of the requirement for the degree of Doctor of Philosophy.

ABSTRACT

This thesis is an attempt to apply the theory of transformational grammar to the Japanese language. This theory was introduced by Noam Chomsky some ten years ago and since then has been successfully applied to the study of several languages, especially English. It is shown here that the application of this theory to Japanese is also very revealing. Comparison of the structure of Japanese and English is also of our concern, whenever possible, and it is seen that the transformational theory is helpful in such contrastive studies.

The thesis may be conveniently divided into two parts; Part One (Chapters I - VI) is devoted to syntax, and Part two (Chapter VII) to phonology. Part one may further be divided into three subparts. The first (Chapter I - III) deals with attachment transformations. The definition and general properties of these transformations are given in Chapter I. In Chapters II and III attachment transformations are used to explain syntactic properties of several particles. The problem of pronominalization is discussed in the second subpart (Chapters IV and V). The first and the second subparts are related through a discussion of indeterminate pronouns. The last subpart (Chapter VI) reveals the formal character of the particles  ga and  o, which parallels the formal character of case distinction in English.

Part two (Chapter VII) treats one particular problem of phonology, the problem of consonant morae. Attention is focussed on the nasalization rule, and its significance is discussed from various viewpoints, generative, historical, and perceptual.

Thesis Supervisor: Noam Chomsky
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The aim of this thesis is to investigate certain aspects of the grammar of Japanese within the framework of the theory of transformational grammar. The first six chapters are devoted to syntax and the last one to phonology.

The syntactic part is not designed to present a miniature grammar of Japanese. Rather, several particular transformational aspects of the language are chosen and discussed. The choice of topics is not entirely arbitrary, however. All the transformations discussed presuppose only the most fundamental phrase-structural machinery and hence are themselves to be taken as fundamental. They are all rather general in nature, and topics particular to Japanese, such as honorifization and stylization, are excluded.

The transformational approach to syntax is shown to be significantly revealing in the study of Japanese syntax, as it has been in the study of English syntax. Indeed, this approach has brought to light certain observations which were not previously obvious.

Comparison with corresponding rules in English is always a concern in this work. In each case, the nature of the apparent dissimilarities in the two languages will be clarified.

Needless to say, there are many important problems in Japanese syntax that are not touched in this work. It is hoped that the result obtained here will serve as a basis for further
study of Japanese syntax. Of course, the rules formulated here must first be subjected to critical scrutiny. Many of them are not simply reformulations of statements found in grammars based on traditional or structural linguistics. Indeed, the facts meant to be represented by the rules have, in certain cases, never been seriously dealt with. Thus, what is open to criticism is not only whether the rules give the right interpretations of the facts, but also whether all relevant facts are taken into consideration.

The last chapter is devoted to a special problem of Japanese phonology, the problem of the consonant morae, or the so-called syllabic obstruent and nasal. Excluding accent features and unproductive and irregular features such as the rendaku, Japanese morphophonemics is rather straightforward and uninteresting. Contrary to syntactic problems, the phonological facts about consonantal morae are fairly simple and have already been observed rather fully. But it will be shown that using the theory of generative phonology, interesting remarks can still be added on this seemingly worn-out subject. This may illustrate how the theory of generative phonology has brought a new insight into phonological studies.

The romanization of Japanese examples is always a problem. Here, space is put between pause-groups in the sense of Bloch (1946), and a hyphen is put between morphemes. But segmentation into morphemes (and even into pause-groups) is sometimes highly arbitrary, and is solely for the convenience of the reader in identifying morphemes. Following Hattori (1951), the
nonGrave, nonContinuant, nonVoiced consonant is represented by ç before i and u. This particular romanization is restricted to the representation of examples, and the Kunrei-siki romanization is used for bibliography references, since the former is not widely adopted, although it seems to be the best among all thus far proposed.

I would like to express my sincere gratitude to Professor Chomsky and Professor Halle for their stimulating teaching throughout my graduate studies at MIT. I am indebted to Professor Chomsky for many improvements and clarifications of the content of this thesis. My deep thanks are also due to Florence Warshawsky for improving my English phrasing.
CHAPTER I. Attachment transformations

1. The theoretical framework of this description of Japanese is the generative theory of language developed in the last ten years. For information about this theory the reader is referred to the standard works in the field by Chomsky (1957), (1962), (1964), (1965). The description here will make use of a particular type of transformation, called attachment transformation, which does not yet have a basis in the theory. Therefore, we shall begin with general remarks about attachment transformations. Consider first the pairs of sentences below. Each pair is regarded as representing a discourse.

(1.a) The storm destroyed his house.
(1.b) The flood even devastated his farm.¹
(2.a) The storm destroyed his house.
(2.b) It (= the storm) even devastated his farm.
(3.a) The storm destroyed his house.
(3.b) It (= the storm) destroyed even his farm.
(4.a) The storm destroyed his house.
(4.b) The flood also devastated his farm.
((4.b-1) Also the flood devastated his farm)
(5.a) The storm destroyed his house.
(5.b) It (= the storm) also devastated his farm.
(6.a) The storm destroyed his house.

(6.b) It (= the storm) destroyed also his farm.\(^2\)

In each of the above pairs two sentences, or parts of sentences, are put in contrast. More precisely, whole sentences are put in contrast in (1) and (4), predicates in (2) and (5), and objects in (3) and (6). From this we may assume that the words *even* and *also* modify the whole sentence in (1.b) and (4.b), the predicate in (2.b) and (5.b), and the object in (3.b) and (6.b). That is, it may be assumed that the words *even* and *also* are directly dominated by the node `Sentence in (1.b) and (4.b)`, by the node `VerbPhrase` in (2.b) and (5.b), and by the node `NounPhrase` in (3.b) and (6.b). Thus, the phrase structure of these sentences may, with some simplification of irrelevant details, be represented as follows:

(7-1)

```
S
  |   
NP VP
  |   
D N V D N
```

Even the flood devastated his farm.

(7-2)

```
S
  |   
NP VP
  |   
D N V D N
```

The storm even devastated his farm.
The storm destroyed even his farm.

Also the flood devastated his farm.

The storm also devastated his farm.

The storm destroyed also his farm.
It is important to note that the position of **even** or **also** before the verb in the surface representation is ambiguous with respect to the deep representation, either modifying the whole sentence as in (1.b) and (4.b) or the predicate as in (2.b) and (5.b). The position of **even** and **also** in the surface representations (1.b) and (4.b) is the result of a late transformation.

Although these phrase-structural representations of sentences (1.a)-(6.b) appear to be reasonable, there are further considerations involved in a generative analysis of **even** and **also**. It has been stated that the predicates of (2.b) and (5.b) are contrasted with those of (2.a) and (5.a), and the objects of (3.b) and (6.b) with those of (3.a) and (6.a). It might further be said that this is reflected in the positioning of **even** and **also** in the representations of these sentences; i.e., if **even** or **also** is directly dominated by VP, the contrast is made with respect to the predicate, and if dominated by the object NP, the contrast is made with respect to the object. It is maintained here, however, that the fact that the predicates are contrasted in (2.b) and (5.b) and the objects in (3.b) and (6.b) is essentially independent from the fact that the second member of each pair contains the word **even** or **also**, and, *a fortiori*, independent from the position of this word in the basic representation. The contrast is more strongly specified in (2) and (5) than in (1) and (4), and still more strongly specified in (3) and (6), simply because the pairing of sentences is, so to speak, more structured in (2) and (5), and even more so in (3) and (6), than in (1) and (4). All this leads us to
recognize that the necessary and sufficient information for the semantic and phonological interpretations of sentences (2.b), (3.b), (5.b) and (6.b) as members of discourse pairs (2), (3), (5), and (6), is simply that the word even or also is contained in the sentences. In other words, given the above assumptions, there seems to be nothing to prevent us from taking the basic representations of (2.b), (3.b), (5.b), and (6.b) to be of the same form as that of (1.b) and (4.b):

(8-2)

(8-3)

(8-5)

Also the storm devastated his farm.
Also the storm destroyed his farm.

Then, (7-2), (7-3), (7-5), and (7-6) will be considered as derived representations of (2.b), (3.b), (5.b), and (6.b), respectively. The following transformation is introduced:

\[(9) \quad X_1[VP_1_{NP_1}]Y_1 \text{###} \text{even} \quad X_2[VP_2_{NP_2}]Y_2 \]

\[\rightarrow X_1[VP_1_{NP_1}]Y_1 \text{###} X_2[\text{even}_{NP_2}] + [VP_2_{NP_2}]Y_2 \]

where \(X_1 = X_2\), \(Y_1 = Y_2\)

This transformation will generate discourse forms (1) - (6).

If it were supposed that sentences containing \textit{even} or \textit{also} always appear as part of a pair as in (1) - (6), transformation (9) would be sufficient to account for such sentences. This would mean, however, that we would have to regard as ungrammatical any simple sentences containing \textit{even} or \textit{also}, unless they were explicitly paired as in (1) - (6). This seems a too severe and counterintuitive limitation on the notion of grammaticality. It must be assumed, then, that some mechanism is needed to generate forms like (1.b) - (6.b) in isolation. Two different formulations will be introduced.

The first, which we shall call the \textit{unspecified compounding approach}, makes use of the same transformational formalism as in (9) but allows the first component of compounding \(X_1[VP_1_{NP_1}]Y_1\) to
be deleted. Since the content of the first component is to be considered semantically unspecified, it is natural to assume that it is also syntactically unspecified when deleted; that is, more formally, what is deleted is a string of (terminal) syntactic symbols, e.g., Det - N - V - Det - N, but not a string of words, e.g., John saw Bill. Accordingly, it is to be assumed either that the deletion (hence transformation (9)) takes place before the lexical rule is applied or that the lexical rule can leave unspecified those syntactic symbols to which transformations (in particular, transformation (9) and the deletional transformation in question) will apply.

The second approach, which we shall call the attachment approach, will introduce the following optional transformation:

\[(10) \quad \left\{ \begin{array}{c}
\text{even} \\
\text{also}
\end{array} \right\} X \left[ \begin{array}{c}
\text{VP} \\
\text{NP}
\end{array} \right] Y \rightarrow X \left\{ \begin{array}{c}
\text{even} \\
\text{also}
\end{array} \right\} + \left[ \begin{array}{c}
\text{VP} \\
\text{NP}
\end{array} \right] Y\]

Trees of the form (7-2) or (7-3) and (7-5) or (7-6) will be derived from trees of the form (7-1) and (7-4), respectively by this transformation.

The difference between these two approaches does not end with the transformational formalism; they also involve different rules to assign the phrase-structure to independent sentences containing even or also. In the attachment approach the following phrase-structure rule is introduced:

\[(11) \quad S \rightarrow \left\{ \begin{array}{c}
\text{even} \\
\text{also}
\end{array} \right\} \text{NP VP}\]

In the unspecified compounding approach, on the other hand, the string \{even\} NP VP is well-formed only if it is the second member of the compounding, and hence the role of (11) is taken by the rule:°
If a simple sentence is defined as having only one occurrence of \( S \) in its basic form, sentences like (1.b) - (6.b) (in isolation) are simple sentences in the attachment approach but not in the unspecified compounding approach.

2. But there is another approach which may be considered standard in the recent framework of the transformational theory. Thus transformations are now viewed not only as devices to yield surface representations from basic representations but also as devices to filter out ill-formed base forms. In accordance with this line of thinking, the following explanation may be given for sentences like (1.b) - (6.b).

(7-1) - (7-6) will now be taken as the basic representations of (1.b) - (6.b). The words even and also are expanded under the nodes \( S \), \( VP \), and \( NP \) by the phrase-structural rules, which are something like:

\[
\begin{align*}
(13) & \quad S \rightarrow \text{[even]} NP \ VP \\
(14) & \quad VP \rightarrow \text{[even]} V \ NP \\
(15) & \quad NP \rightarrow \text{[even]} D \ N
\end{align*}
\]

It is, however, supposed that even (or also) directly dominated by \( S \) is mutually exclusive with even (or also) directly dominated by \( VP \) or \( NP \). Thus, forms like the following are assumed to be ill-formed:

\[
(16) \quad \text{*The flood even even devastated his farm.}
\]

(where the first even is assumed to modify the whole sentence and the second the predicate), and:
(17) *The flood even destroyed even his farm.

However, as context-free rules, (13) - (15) will produce these unacceptable forms, and a transformation must therefore be introduced to filter them out. 5

It could be maintained that the attachment approach complicates the over-all theoretical scheme of generative grammars because it introduces transformations like (10), which presumably change meaning. On the other hand, filtering approach does not add a new notion because the concept of filtering is needed in grammars anyway. However, the following may be worth noting in this regard.

If unacceptable forms like (16) and (17) are formed and then be filtered out, the filtering procedure has to take place within the realm of simple sentence formation. But conceptually (as well as formally, as will be pointed out later) there is a difference between the filtering of ill-formed complex sentences and ill-formed simple sentences. Indeed, one of the fundamental properties of grammars is that the symbol $S$ is the sole recursive element in the phrase-structural rules, and hence every sentence is reducible to a certain combination of simple sentences. Filtering in connection with sentence embedding (i.e., complex sentence formation) can be regarded as related to this particular recursive property of language. Vaguely but highly suggestively, the filtering out of ill-formed complex forms may be regarded in a sense as a process which selects, out of all possible free sequences of sentences (that can be considered discourses in the most extended sense), those that can be combined into
one sentence. Furthermore, the ill-formedness arising from an inappropriate combination of sentences may still, in some sense, be differentiated from the total "chaos" of meaning that exists in cases like (16) and (17). Indeed, at least as far as a generalized base form can be paraphrased by a sequence of simple sentences (let us call this discourse paraphrase), its discourse paraphrase can have a meaning (although the meaning may be anomalous) even if it is ill-formed as a complex sentence. Thus, for example, assume that

(18) A man whom John knows is standing there.

may be paraphrased by

(19) A man is standing there.

(20) John knows that man.

If someone says

(21) A man is standing there.

(22) John knows that boy.

it will strike the hearer as strange, but this strangeness is somewhat like the strangeness of, say,

(23) This round table is square.

Then, in the sense that (23) has a meaning, (21)-(22) may also be considered to have a meaning, and so may the generalized base form:

(24) A man # John knows that boy # is standing there.

Sentence (23) may be put in the discourse form:

(25) This table is round.

(26) It is square.

Let us compare the anomalous discourses (21)-(22) and (25)-(26).
If language did not possess the syntactic device of relativization, complex sentences like (18) and (23) with relative clauses would not obtain, and the ideas expressed by such sentences would instead be expressed by the compounding of simple sentences like (19)-(20) and (25)-(26). If that were the case, any significant difference between the anomaly of (21)-(22) and that of (25)-(26) might not be detected. Given the relative transformation, however, the anomaly of (21)-(22) will be detected syntactically and filtered out, while apparently there is no transformation fine enough to distinguish anomalous ideas such as expressed in (23).

Let us now look at this more formally. Since not many syntactic descriptions with an explicit formulation of the filtering process are available as yet, it is difficult to make definite statements. Still, it seems reasonable to suppose that the filtering out of unacceptable forms in sentence embedding is an automatic result of some general procedures in accordance with particular types of transformations. Take for instance the case of the relative clause transformation as discussed in Chomsky (1965). The phrase:

(27) the man # the man persuaded John to be examined by a specialist#

is well-formed and will be actualized as:

(28) the man who persuaded John to be examined by a specialist

But the form:

(29) the man # the boy persuaded John to be examined by a specialist #
is ill-formed and will be filtered out. The relative clause transformation involves a deletion, and, according to Chomsky, (29) is blocked because of the general condition that only recoverable deletion is permitted. Thus the filtering out of form (29) results automatically from the particular shape of the relative clause transformation and from a general principle, and it is not the case that a special filtering procedure must be formulated as a rule of English grammar. It does not seem accidental that filtering in connection with the relative clause transformation is taken care of in a completely general way; relative clause formation is a very general grammatical device which probably exists in every language. It is not immediately clear whether filtering can work in such a general way with transformations that are less general than relativization. At any rate it still seems reasonable to say that filtering is more or less connected with the positive role of transformations in deriving surface forms from well-formed base forms. With regard to filtering within the realm of simple sentence formation, e.g., the filtering out of forms like (16) and (17), the situation seems different. Here it appears that we must introduce special filtering transformations which have no positive role at all in deriving the surface forms of sentences.

Thus, it can be seen that conceptually as well as formally the filtering out of ill-formed simple sentences is quite different from the filtering out of ill-formed complex sentences. Consequently, the fact that the notion of filtering is necessary in connection with complex-sentence formation does not auto-
matically guarantee that it can be used in simple-sentence formation.7

3. Let us now turn our attention to interrogative sentences. There are, currently, two different views about the markers involved in such sentences. One view assumes two markers, Q and WH, while the other assumes only WH. We shall subscribe to the latter view here, but the essential point of our discussion would not be affected should two markers be set up instead of one.

It is quite clear that wh-words require some kind of transformational treatment in the formation of simple sentences. A wh-word can occur in a simple sentence only if that sentence is not a "yes-no" question. Stated more formally, a node labeled NP may dominate what, for example, only if the marker WH does not appear at the head of the sentence. This contextual restriction is similar to that observed for even and also.8 If there is recourse to a filtering device, NP will first be freely expanded to what, and then a filtering transformation will apply to filter out sentences with occurrences of WH both at their head and internally.

Unlike even and also, wh-words have been much discussed in transformational studies of English. Except for the recent work by Katz-Postal (1964), the positioning of WH in certain noun phrases is dealt with by a singulary transformation.9 Our intention here is to present a (metagrammatical) justification for the use of a singulary transformation to describe wh-questions.
Let us consider the following *wh*-question:

(39) Who bought books?

This is in some sense related to the compounding of so-called "yes-no" questions like:

(40) Did John buy books?

Let us suppose that we are given a particular discourse context in which, say, three persons, John, Bill, and Tom, are referred to. Put into this context, (39) is paraphrased by the disjunctive sentence:

(41) Did John buy books, or did Bill buy books, or did Tom buy books?

then (41) may be transformed into:

(42) Did John, Bill, or Tom buy books?10

For any set of \( n \) human nouns \( N_1, N_2, \ldots, N_n \), we can conceive of a discourse context in which (39) is equivalent to:

(43) Did \( N_1 \) buy books, or did \( N_2 \) buy books, \ldots, or did \( N_n \) buy books?

or to its transform:

(44) Did \( N_1, N_2, \ldots, \) or \( N_n \) buy books?

Similarly, for any set of \( n \) nouns \( N'_1, N'_2, \ldots, N'_n \), insofar as their syntactic feature specifications are compatible with the context

(45) John bought ____.

we can conceive of a discourse context in which

(46) What did John buy?

is equivalent to

(47) Did John buy \( N'_1 \), or did John buy \( N'_2 \) \ldots, or did John buy \( N'_n \)?

or to its transform:
Did John buy \( N'_1, N'_2, \ldots, \) or \( N'_n \)?

It is probably too much to claim the converse of the above statement in the strict sense, that is, to claim that whenever (39) (or (46)) is uttered we can paraphrase it in that particular context by forms like (43) (or (47)) with an appropriate choice of nouns \( N_1, \ldots \) (or \( N'_1, \ldots \)). When one asks a question like (39) or (46), he may not have a **definite** idea of the possible candidates for the answer. Still, to some extent it can be said that such a question can be approximated by certain disjunctive questions of the type (43) or (47). The fact that one can always surprise a questioner by giving a totally unexpected answer may be indirect evidence that the questioner presupposes the range of possible answers to some extent.

In this sense interrogative sentence (39) (or (46)) stands in a special relation, with respect to paraphrasability, to the set of disjunctive questions like (43) (or (47)).

The basic representation of the interrogative sentence (40) is taken to be:

(49) \( \text{WH John bought books.} \)

Then the disjunctive questions (43) and (47) will have the basic forms:

(50) \( \text{WH } N_1 \text{ bought books, or WH } N_2 \text{ bought books,} \)

\( \ldots \text{ or WH } N_n \text{ bought books.} \)

(51) \( \text{WH John bought } N'_1 \text{ or WH John bought } N'_2 \ldots \text{ or WH} \)

\( \text{John bought } N'_n. \)

These forms will be transformed into:

(52) \( \text{WH } (N_1, N_2, \ldots, \text{ or } N_n) \text{ bought books.} \)

(53) \( \text{WH John bought } (N'_1, N'_2, \ldots, \text{ or } N'_n). \)
which are intermediate underlying forms of (44) and (48).

On the other hand, the generative explanation of (39) and (46) is as follows. The basic forms are:\[11\]

\[(54) \quad \text{WH} \text{ someone bought books.}\]

\[(55) \quad \text{WH} \text{ John bought something.}\]

Then WH is adjoined to someone and something, respectively, to give

\[(56) \quad \text{WH+someone bought books.}\]

\[(57) \quad \text{John bought WH+something.}\]

from which (39) and (46) will be derived. But note now the formal similarity between the schemata (52) and (53) and the basic forms (54) and (55). Indeed it is rather clear that (54) and (55) (or, more specifically, someone and something) are the most appropriate forms to represent the schemata (52) and (53) (or the subschemata \(N_1, N_2, \ldots, N_n\) and \(N'_1, N'_2, \ldots, N'_n\)) within the finitary mechanism of syntax. Thus we may have as a syntactic rule:\[12\]

\[(58) \quad \text{WH} X \text{ some}\{\text{one } \text{thing}\}_Y \rightarrow X \text{ WH} \text{ some}\{\text{one } \text{thing}\}_Y\]

Let us now put together the observations made here and in the preceding section. On the one hand, the discussion in section 2 indicates that transformations related to complex-sentence formation can be regarded in a natural way as filters which separate certain anomalous meanings from other meanings (which can be anomalous like (23), however.) But the application of filtering in simple-sentence formation is not compatible with this natural interpretation of transformations as filters. Indeed, with regard to interrogative sentences, it would be necessary somehow to filter out forms like:
(59) WH who saw Bill?

which, like (17) and (18), seem to represent complete semantic chaos.\textsuperscript{13} On the other hand, it was shown in this section that an approach which is essentially faithful to the original formulation of transformational theory can also be given a very natural (metagrammatical) interpretation. Thus, this attachment approach would seem to be better justified than the filter approach.

Finally, to explain sentences such as:

(60) Who bought what?

We assume here that WH can be attached more than once. Thus, rule (58) is revised as follows:

(61) \[ \text{WH X some}_{\text{one}} \left( \text{thing}_Y \right) \rightarrow \text{WH X WH some}_{\text{one}} \left( \text{thing}_Y \right) \]

This formulation implies that if X or Y contains \textit{some}, WH is still available for attachment to it by the same rule. To remove the sentence-initial WH, one more rule is needed:\textsuperscript{14}

(62) \[ \text{WH X} \rightarrow \text{X if X contains WH} \]

In appropriate contexts (60) may be paraphrased by

(62') Did John buy books or did John buy magazines

or did Bill buy books or did Bill buy magazines?

This sentence can obviously be generalized by a schema containing an arbitrary number of human nouns and an arbitrary number of nonhuman nouns.

4. Note now the formal similarity between rule (10) and rule (58). Once (58) or (61) is introduced into the grammar as a rule, there seems to be no formal reason for not introducing (10) as well. But one must ask whether (10) has some substantial justification of its own. Furthermore, in this
case we must consider the unspecified compounding approach as well as the filtering approach in our justification of rule (10) and the attachment approach it implies.

If we examine closely what it is that the unspecified approach seems to express, it turns out that rule (10) has the same kind of justification as rule (58). Consider first the sentence:

(64) Even John bought books.

It is assumed that this sentence implies the existence of some other sentence(s) with which it is put in contrast. According to the unspecified compounding approach, this other form would be represented by an unspecified sentence, NP bought books. The precise meaning of "unspecified" here is not immediately clear. However, one may certainly say that someone (something) in rule (58) represents in some sense an unspecified noun (actually the unspecified noun phrase NP has also been used in the formulation of the wh-question transformation), and may recall the role of someone (something) in the discussion justifying rule (58). Then, one may note that in appropriate contexts what seems to be meant by:

(65) NP bought books and even John bought books.

is paraphrased by:

(66) Bill bought books and even John bought books.

It was mentioned previously that in the basic representations, even is assumed to be attached to the whole sentence. Thus, the basic form for (66) is

(67) Bill bought books and even (John)NP(bought books)VP.
Since (65) is assumed to appear as (64), it follows that (64) is assumed to be synonymous with (67) in appropriate contexts. As before, the number of nouns need not be two, and appropriate contexts may be conceived of in which (64) is synonymous with:

(68) \( N_1 \) bought books, \( N_2 \) bought books, \( \ldots \), \( N_{n-1} \) bought books, and even \((\text{John})_NP \) bought books,

where \( N_1, N_2, \ldots, N_{n-1} \) are \( n-1 \) arbitrary human nouns. Consequently, just as (39) stands in a special relation to schema (43) with respect to paraphrasability, so does (64) with schema (68). Now the transformation which is similar to (9) but extended to \( n \) terms will transform (68) into

(69) \( N_1 \) bought books, \( N_2 \) bought books, \( \ldots \), \( N_{n-1} \) bought books, and (even \( \text{John} \))\(_{NP} \) bought books.

Furthermore, as schema (44) was derived from schema (43), the following schema may be derived from (68):

(70) \((N_1, N_2, \ldots, N_{n-1} \text{ and even John})_{NP} \) bought books.

In the case of the \( \text{wh} \)-question, the subschema \( N_1, N_2, \ldots, N_{n-1} \), \( \text{or } N_n \) was replaced by \underline{someone}, and (56) was taken as a syntactic expression of schema (44). But in the present case there is no need for the intervention of neutral forms such as \underline{someone}, since the form \underline{even John} is sufficient to represent the subschema \( N_1, N_2, \ldots, N_{n-1}, \text{ and even John} \). The operation of the adjunction of \underline{even} represents, as does the operation of the adjunction of \underline{WH}, the structuring in the unspecified compounding. The same argument holds for the word \underline{also}. Thus, if (58) is admitted as a syntactic rule, (10) can be admitted on the same grounds. Under this interpretation, (10) is as informative as (or more informative than) (9) used with the first
component unspecified and appears formally simpler. Rules like (10) and (58) will be called attachment transformations. Formally and substantially they are characterized as follows. Formally they have one of the following forms:

(71) Left-sided noniterative
\[ M \times C \times Y \rightarrow X \times M+C \times Y \]

(72) Left-sided iterative
\[ M \times C \times Y \rightarrow M \times X \times M+C \times Y \]

(73) Right-sided noniterative
\[ X \times C \times Y \times M \rightarrow X \times C+M \times Y \]

(74) Right-sided iterative
\[ X \times C \times Y \times M \rightarrow X \times C+M \times Y \times M \]

Here C denotes certain constituents or morphemes to be specified in each rule. An iterative attachment is generally to be accompanied by a deletional transformation of the form:

(75) \[ M \times X \times M+C \times Y \rightarrow X \times M+C \times Y \]

or

(76) \[ X \times C+M \times Y \times M \rightarrow X \times C+M \times Y \]

Substantially, an attachment transformation is assumed to be given a metagrammatical interpretation similar to that given to (10) and (58). It stands in a special relation, with respect to paraphrasability, to a particular schema of sentence compounding. The attachment transformation itself will not establish within the grammar a paraphrase relationship between the sentence S to be generated by it and certain definite compound sentences. But S is assumed to be paraphrased by each realization of the schema in appropriate contexts. The operation of the adjunction of M to C reflects a particular structuring in the sentence compounding which makes the constituent C distinguished.
According to one informant, the discourse (1.a)-(1.b) is well-formed, but combining the two sentences into one by means of and results in an unnatural form:

The storm destroyed his house and the flood even devastated his farm.

Another informant accepted (1.a)-(1.b) only after some hesitation. Thus it is expected that some readers may disagree as to the acceptability of this discourse. However, grammaticality encompasses more than just "good" speech, and with this in mind perhaps even doubtful readers can judge the discourse as well-formed. The author, as a nonnative speaker of English, cannot dispute the judgement of a native speaker about the grammaticality of English forms. Those who cannot at all accept (1.a)-(1.b) as a discourse are simply asked to follow our discussion with the assumption that it is acceptable. The importance of the argument that follows lies in certain of its general theoretical aspects and not in its syntactic interpretation of a particular English construction. Even if (1.a)-(1.b) is not acceptable, it is believed that the English word even can still be treated along the lines sketched below with some modification.

\(^2\)(6.2) may not be completely natural, and one might instead say:

It (the storm) destroyed his farm also.
But whether also precedes or follows his farm is not essential for our discussion; this is rather a morphophonemic problem to be considered independently.

3. The following convention will be established for the plus sign used in connection with an adjunction transformation: when an element E is adjoined to a certain constituent, say, for example, NP, from the left (or from the right), E+NP (or NP+E) indicates that E becomes the left-most (or right-most) constituent directly dominated by NP.

4. This is not the only phrase-structure rule for sentences containing even or also in the unspecified compounding approach. For example one might have the rule:

\[ \text{Sen} \rightarrow \text{S} \quad (\{\text{even} \} \text{NP VP} \{\text{also}\}) \]

This fact does not change the main point of our discussion. Incidentally, so long as it is considered that generative grammar must concern itself with explicitly paired discourses like (1) - (6), rule (12) is also needed in the attachment approach to generate the form \[ S \{\text{even}\} S \] but not \[ S \{\text{even}\} S S. \]

5. Technically speaking it is certainly possible to formulate a set of phrase-structural rules that will generate only grammatical forms. It seems obvious, however, that the restriction on even and also is transformational, and that an attempt to account for it within the phrase structure would simply miss this linguistically significant fact.

6. Recently E. Bach (1965) made an interesting remark on this point.
Insofar as it is considered to filter out ill-formed complex sentences, the filtering function of the transformational component has always been implicit in transformational theory in the selection of permissible transformational markers (cf. Chomsky (1965)). Explicit recognition of the filtering function is quite important, however, in that it allows the structural conditions, formerly fully stated in each transformation, to be captured in more general terms and to be reduced, in the most favorable cases, to universal properties of the particular elementary transformations involved. (Cf. the above discussion of relativization taken from Chomsky (1965)) Thus, making the filtering function explicit can serve to simplify the grammar of a language considerably without essentially changing its theoretical basis. On the other hand, the implications involved in introducing transformations that serve only to filter out certain ill-formed simple sentences cannot be understood merely as a clarification of the earlier theory.

It should be noted that wh-words can appear more than once in a sentence:

Who bought what?

while also or even cannot:

*Even John bought even books.
*Also John bought also books.

We shall return to this point later. In the meantime, to simplify our discussion, we shall restrict ourselves to sentences with at most one wh-word.

10 This surface form is, except for intonation, homophonous with the "yes-no" question related to the disjunctive sentence:

John bought books or Bill bought books or Tom bought books.

or

John, Bill, or Tom bought books.

(41) and (42) should not be confused with the "yes-no" question here.

11 Those basic forms are suggested in Klima (1964), fn. 6.

12 This rule will be reformulated below to take care of sentences with more than one wh-word, as in footnote 8.

13 It might be thought that (59) could be considered the basic form of the echo question:

(A) Did who see Bill? (echo question)

which could be a response to, for example:

(B) Did John see Bill?

However, one can also think of an echo question as a reaction to an affirmative sentence:

(C) John saw Bill.

(D) Who saw Bill? (echo question)

Question (D) is different from both (A) and the wh-question:

(E) Who saw Bill? (wh-question)

This seems to indicate the difficulty involved in dealing with echo questions solely with the marker WH and taking (59) to be
the basic form for (A). At present, however, we are not proposing any particular method for treating the echo question.

14 Apparently this deletional rule may have to be combined with the familiar rule for the deletion of WH in "yes-no" questions. We will not be concerned with this problem here.

15 The relation between rules (9) and (10) may need a further comment. Rule (10) was introduced to generate independent sentences with even or also. Rule (9) is still needed, as long as discourses like (1) - (6) are assumed to be within the range of generative grammars. More generally, for each n > 1, a version of rule (9) extended to \( n \) terms is to be assumed, as well as a shortening rule to derive forms like (70) from forms like (69). Just how such a schema of rules should be incorporated into the grammar is as yet not clear. At any rate, rule (10) should not be confused with a schema of rules; any rule, or combination of rules, of the schema of rules like (9) and the shortening rules cannot generate sentences like (64). The relation between rule (10) and this schema of rules parallels the relation between rule (58) and the schema of rules that derives forms like (44) or (48) from forms like (43) or (47); each rule of the schema is needed to generate a sentence like (42), but none can generate (39).

16 Theoretically the formal condition above is arbitrary in the following sense. One could conceive of a language in which, for example, the wh-question is formed by repeating the indefinite determiner some. Thus, instead of

Who bought books?
we would have

Some-someone bought books?

The wh-rule would then take the form of reduplication instead of adjunction:

\[
\text{WH } \text{X some} \{ \text{one} \} \text{thing} \rightarrow \text{X some-some} \{ \text{one} \} \text{thing} \]

There would then be no reason for admitting (58), but not this reduplicative rule, as a syntactic rule.
1. In Japanese there are two particles *wa* and *ga* that are often understood to denote the subject of the sentence. In general, an English sentence seems to be translatable into Japanese in two different ways, attaching one or the other of these particles to the Japanese noun that translates the original English subject. Thus:

(1) John bought books.

may be translated either as:

(2) John-wa hon-o kat-ta.

book buy

or as

(3) John-ga hon-o kat-ta

However, this does not mean that these two Japanese sentences are synonymous. The native speaker clearly differentiates between them, intuitively if not consciously, and does not fail to use the right one in the right context. Hence we must first clarify the semantic difference between constructions with *wa*, as in (2), and those with *ga*, as in (3), and then determine their syntactic structures. Toward this end we shall examine the notion of subject and shall have to depart from its tra-
ditional interpretation in Western grammatical thinking.

Even in English the notion of subject is by no means clear, and there has much been discussion about the distinction between logical and grammatical subjects. This traditional problem has been carried over to transformational theory in terms of the distinction between the underlying and derived (or surface) subjects. However, the problem we are now going to concern ourselves with is a different one. We can restrict ourselves to cases where the notion of subject seems quite clear, as in sentence (1), and still be able to discuss our problem. Accordingly, it will be assumed in this chapter that the notion of subject is well established in English grammar.

In the Western grammatical tradition, the sentence is regarded as the linguistic expression of logical judgment. To quote a passage from Port-Royal's logic:

Once we have formed ideas of things, we compare the ideas. We unite those which belong together by affirming one idea of another; we separate those which do not belong together by denying one idea of another. To judge is to affirm or to deny.

The product of judging is expressed by a sentence which must contain two terms -- the one term is the subject, which expresses the idea of which we affirm or deny another idea; the second term is the predicate, which expresses the idea which is affirmed or denied of the idea expressed by the subject.
In judging, the mind not only conceives two ideas but also unites or separates them. The result of this activity of the mind is a proposition expressed by a sentence in which the verb 'is' either alone or with a negative particle connects the terms that express the ideas that are affirmed or denied. When I say 'God is just,' the idea of God is joined to the idea of just; and this idea is the attribute of the proposition expressed by the sentence. The word 'is' indicates my joining the idea of God with the idea of just. If we say 'God is not unjust,' 'is not' indicates my separating the idea of God from the idea of unjust. I separate the two ideas because there is something in the idea of unjust which is contrary to the idea of God.

Although every proposition is necessarily composed of three elements - the subject-idea, the attribute, and the joining of these two ideas -- a proposition may, nonetheless, be expressed by two words, or even by one word, as we explained in the preceding chapter.

Men, to shorten their discourse, use words which express the attribute of a proposition and at the same time indicate assertion. All verbs except the copulative verb have this dual function -- 'God exists' means that God is existing; 'God loves mankind' means that God is a lover of mankind. Even the 'copulative' verb in expressions such as 'I think, therefore I am' has this dual function; for in such an expression the most general of attributes--the attribute of being--is understood.
Hence, 'I am' means the same as 'I am being'. (Arnauld (1662) pp. 108-9)

This is a typical statement identifying the grammatical notion of sentence with the logical notion of judgment and predication. (Imperative and optative sentences may be excluded here, of course, but for our purpose we need only concern ourselves with typical declarative sentences.) It is maintained here, however, that not every sentence can be interpreted logically as a predication; the sentence may not necessarily be a predication but rather a statement or description of a fact or situation.

It is first necessary to clarify the notion of judgment assumed here. Two or three different kinds of judgment must be distinguished, but at this point we shall concentrate on one, which we shall call predication and which consists of a premise and a conclusion, of the form:

(4) If X is A, then X is B (is true).
In language this judgment appears in the form:

(5) A is B.

or, more generally, as stated in Port-Royal's logic, a verb plays the dual role of is and B above and the judgment may appear in the form:

(6) A B.

where A is the subject and B the predicate of a sentence in the traditional sense. For example, the sentence quoted in the above passage:
(7) God is just.

may perhaps be reformulated in the form of (4) as:

(8) If something (or someone) is God, It (or He) is just.

Similarly,

(9) God loves mankind.

may be reformulated as:

(10) If something (or someone) is God, It (or He) loves mankind.

Thus, we may say that when the sentence is predicational, its subject is taken as the premise of the predication.

The claim made here is that a sentence does not necessarily represent a predication in the above sense but may be merely a description of a fact or situation. In such a sentence, which we shall call a nonpredicational description or simply a description, the subject can be considered neither the premise of some judgment nor something about which a predication is made. Rather, the subject of the sentence is nothing more than an item which stands in a particular relation to the verb of the sentence, just as the object, if the sentence has one is an item which stands in a particular relation to the verb. It is problematic whether one can describe this particular relation of the subject to the verb as the "actor" of the "action." But if, for now, we avail ourselves of this interpretation, then we may say that the subject denotes the actor in both a predication and a nonpredicational description; but when the sentence is a predication, the role of the logical premise is superimposed on the role of the actor of the action.
In English there is no grammatical device to differentiate predicational judgments from nonpredicational descriptions. This distinction does cast a shadow on the grammatical sphere to some extent, but recognition of it must generally be made in semantic terms. It is maintained here that in Japanese, on the other hand, the distinction is grammatically realized through the use of the two particles wa and ga.

2. We shall first discuss this problem with reference to English. Let us assume that someone sees a man standing at the corner of a street and says:

(11) A man is standing at the corner of the street.
Sentence (11) is not a predication but merely a description of a scene, that is, it is a nonpredicational description. In other words, this sentence is not a predication about a man, but a man is involved in the sentence merely as an item in the scene which has a particular relation, the grammatical relation of subject, to the verb stand. We cannot paraphrase sentence (11) by some form like:

(12) If someone is a man, he is standing at the corner of the street.
where a man corresponds to the logical premise of a predication. Perhaps a more convincing, but basically similar, example is:

(13) Two men are standing at the corner of the street.
Again, this is not a predication about two men.
(14) Two men are drinking water.
This sentence is neither a predication attributing to two men the property of drinking water nor a predication attributing
to water the property of being drunk. In this sense, from
the logical viewpoint, a man does not play any special role
not played by water. It is assumed here, then, that the
utterance of such sentences as (11), (13), and (14) is very
much like the utterance of so-called one-word sentences like:

(15)  Dog!

These are all descriptions of a situation. The difference lies
in the fact that there is more involved in the situations
described in the former case than in the latter so that the
descriptions take the form of full sentences. But it is not
unreasonable to think of the following nominal expressions
as being fairly close to (11), (13), and (14):

(16)  A man standing at the corner of the street!
(17)  Two men standing at the corner of the street!
(18)  Two men drinking water!

On the other hand, if another person, upon hearing (11),
responds with:

(19)  No, that man is not standing,
(20)  but (he is) sitting on a chair.

sentences (19) and (20) are then predicational, with that man
as the premise. These sentences express the judgment of the
speaker that the attribute of sitting on a chair is to be
ascribed to that man rather than the attribute of standing.
Conceivably, instead of (19) and (20) one may say:

(21)  If you mean that man, he is not standing but sitting
    on a chair.

This would be the conversational equivalent of expressing (19)
and (20) in the predication form represented by (4).
It may be further noted that the nominal form:

(22) That man not standing but sitting on a chair.
cannot in any sense replace the predicational sentences (19) and (20).

Indefinite noun phrases are the subjects of sentences (11), (13), and (14) while definite noun phrases are the subjects in (19) and (20). An indefinite noun phrase may be specific or nonspecific; those in the above examples are specific. In other words, the indefinite noun phrases in (11), (13) and (14) have specific referents. We will now maintain that a specific indefinite noun (phrase) cannot be the subject of a predicational sentence; we cannot attribute a property to something referred to in an indefinite way. In other words, a predication requires an item that is linguistically or extralinguistically (i.e., anaphorically or independently) definite. This does not mean, conversely, that a definite noun cannot be the subject of a nonpredicational description; furthermore, an indefinite noun that is not specific can be the subject of a predicational sentence. Before examining these cases, we shall make two additional remarks.

First, such sentences as:

(23) A big man is standing at the corner of the street.
may at first be taken as exceptions to the claim that a specific indefinite noun cannot be the subject of a predicational sentence, since here the property of bigness is attributed to the specific indefinite noun man. However, the underlying form of the complex sentence (23) can be taken to be:
(24) A man # WH that man is big # is standing at the
corner of the street
Thus, the predication is actually made on the definite noun
that man, although on the surface level the definiteness marker
is not obvious. For a justification of the underlying form
(24), see Kuroda (unpublished b).

Second, it is observed that the sentence:

(25) *A man is intelligent.
does not sound natural. Indeed, if (25) is to be taken to be
a predicational judgment, then the subject a man has to be
generic, and the judgment is semantically anomalous. On the
other hand, the adjective intelligent represents a constant
and inherent quality of a person, so that a person's being
intelligent cannot be considered an event or a situation.

(26) An intelligent man!
which may be taken to be similar to a descriptive sentence,
contains a subordination and, as pointed out above, the
predication is made on a definite noun inside the subordinate
sentence:

(27) A man # WH that man is intelligent
The unnaturalness of forms like (25) generally holds for
adjectives that denote certain constant or inherent qualities
of a man or a thing. But some adjectives may denote something more or
less transient in nature, such as sick and sleepy. In this
case expressions like (25) may be acceptable under certain
circumstances. The comments made in this paragraph are also
generally applicable to Japanese, as will be seen below.
Let us now return to our main discussion. In (19) and (20), definite nouns are the subjects of predication. However, since English has no grammatical device to differentiate between predications and nonpredicational descriptions, the same form can be read as a predication and as a nonpredicational description. This ambiguity can be dealt with semantically, but not syntactically, in English grammar. But the problems of English grammar are not the main concern here, and we are interested merely in giving some English examples that relate to our discussion.

If the person who was to utter sentence (11) recognized that a man standing at the corner of the street was John, he would have said:

(28) John is standing at the corner of the street.

Thus the discourse environment of (11) and (28) is the same except for the interchange of John and a man, and (28) should be a description of situation and nonpredicational if (11) is so. It is reasonable to assume that (28) can be replaced in some sense by the nominal expression:

(29) John standing at the corner of the street!

It is obvious, on the other hand, that (28) can also be a predication.

We said that an indefinite noun which is specific cannot be the subject of predication. But if it is nonspecific, it can be, in which case the predication is a so-called generic sentence. Thus,

(30) A man is mortal.
is predicational. This is the same as saying

(31) If something is a man, it is mortal.

A nonspecific indefinite noun plays the role of a logical variable. Besides nonspecific indefinite nouns, nouns with a so-called determiner such as every, some, or any may also play the same role. (Of course some may be used specifically, that is, as a plural form of the specific indefinite article a.)

Nouns that behave like a logical variable will be called indeterminate. The range of an indeterminate noun as a logical variable is specified by a modifier of the noun. Thus, in:

(32) Every man in this room speaks English.

the modifier in this room specifies the range of the logical variable. More precisely, an indeterminate noun phrase is an amalgam of the logical notions of the logical variable, its range, and the logical quantifier that binds the variable.

Some and the numerals imply the presence of the existential quantifier. Thus, there are existential statements such as:

(33) Some men in this room speak English.

(34) Two men in this room speak English.

These existential statements are not descriptions, and we would certainly like to regard them also as judgments, although they do not quite fit the model form of (4). Logical paraphrases of (33) and (34) would be:

(35) There exist in this room some men who speak English.

(36) There exist in this room two men who speak English.

Thus, we can add to (4) another model form of judgments:

(37) There exists A such that A is B.

In language this form of existential judgment is generally
expressed as

(38)  A is B.

or

(39)  A B.

where A is an indeterminate noun phrase with the determiner corresponding to the existential quantifier; then A is taken as the subject of the sentence.

To summarize what has been said, a definite noun may be the subject of either a predication or a nonpredicational description; the indefinite specific noun can be the subject only of a nonpredicational description; the indeterminate noun can be the subject only of an existential or predicational judgment.

As already mentioned, the distinction between predication and description is not directly realized in English by a syntactic device, which generally results in semantic ambiguity in sentences with a definite noun as the subject. However, it can be seen from the discussion so far that this distinction is interdependent with many syntactic features. The summary in the preceding paragraph provides an example of this, as does the remark made above about adjectival sentences. There are other observations of this sort that can be made.

First, there is certainly some correlation between predication and sentences with the main verb in the present (not present progressive); that is, such sentences are predominantly predicational. The case of adjectival sentences mentioned above may be regarded as a special instance of this more general case. A more refined syntactic characterization
of this correlation would be an interesting topic, but it is beyond our area of interest here.

Secondly, sentence negation seems, in general, possible with judgments but not with nonpredicational descriptions. Seeing a man who is sitting on a chair, one would not say:

(40) *A man is not standing.

But whether the sentence

(41) No man is standing there.

should be taken as a nonpredicational statement or as some sort of judgment is not clear. Actually, the corresponding positive sentence:

(42) Some men are standing there.

may be either a nonpredicational description (with an indefinite plural noun phrase some men) or an existential judgment (with an indeterminate noun phrase some men). It is worth noting, however, that the negation (41) of (42) does not apparently take the form of sentence negation.

3. Let us now turn our attention to Japanese. The following are sentences that translate various English sentences given previously:

(43) kami-wa koosei-de ar-u.

God just is

God is just (=7)

(44) kami-wa zinrui-o ai-su-ru.

God mankind love

God loves mankind. (=9)
It can be immediately observed from these sentences that the English subject of a predication is translated in Japanese with a _wa_-phrase, while the subject of a nonpredicational description appears as a _ga_-phrase. Thus, this distinction, which is semantic in English, is reflected syntactically in Japanese by a distinction between the _wa_-phrase and _ga_-phrase. Accordingly, sentence (28), which semantically can be interpreted in two ways, as predication and as nonpredicational description, has two different equivalents in Japanese:

(50) John-wa macikado-ni tat-te i-ru.

John is standing at the corner of the street. (=28)

(51) John-ga macikado-ni tat-te i-ru.

John is standing at the corner of the street. (=28)
This observation does not completely explain the use of \textit{wa}- and \textit{ga}-phrases, however. We shall refine our description of these phrases by continuing to consider the Japanese equivalents of English forms used above.

Form (25) was said to be ungrammatical. Similarly, in Japanese, we cannot say:

\begin{align*}
(52) \quad *\text{hito-ga rikoo-da}. \\
\text{man intelligent} \quad &\text{*A man is intelligent.} (=25)
\end{align*}

Let us take another example:

\begin{align*}
(53) \quad *\text{hito-ga byooki-da}. \\
\text{man sick} \quad &\text{A man is sick.}
\end{align*}

This form does not sound quite natural, either. To clarify the point further, let us suppose that someone sees a man lying down. He may describe the situation by saying:

\begin{align*}
(54) \quad \text{hito-ga taore-te i-ru}. \\
\text{man lie} \quad &\text{A man is lying down.}
\end{align*}

and may then make a judgment:

\begin{align*}
(55) \quad \text{ano-hito-wa byooki-da}. \\
\text{that man sick} \quad &\text{That man is sick.}
\end{align*}

Or, the judgment and a description can be combined:

\begin{align*}
(56) \quad \text{byooki-no hito-ga taore-te i-ru}. \\
\text{sick man lie down} \quad &\text{A sick man is lying down.}
\end{align*}

However, a description such as (53) is not possible:
Now if, on the one hand, use of the _ga_-phrase is restricted to nonpredicational descriptions and, on the other hand, use of the copulative expression _byooki-da_ is restricted to predications, then it should follow that the _ga_-phrase can never be the subject of the predicate _byooki-da_. But this is not true, as seen below:

(57) ana-hito-ga byooki-da.
    that man sick
    That man is sick.

    John is sick.

The English translations of (57) and (58) do not really help to clarify the meaning of these two sentences. The two English sentences are more naturally taken to be translations of:

(59) ana-hito-wa byooki-da.
    That man is sick.

(60) John-wa byooki-da.
    John is sick.

which represent the familiar type of predication. But sentences (57) and (58) are not descriptions either; seeing John lying on a bed, one would say:

(61) a, John-ga biyooki-de ne-te i-ru.
    sleep (lie)
    Oh, John is lying sick (on the bed).

but not:

(62) a, John-ga byooki-da.
    Oh, John is sick.
The difference between the kind of judgment represented by (57) and (58) and that represented by (59) and (60) lies in the fact that (57) and (58) mean not only that \textit{that man is sick and John is sick} in the usual reading of these English sentences, but also, conversely, \textit{the sick one is that man and the sick one is John}. Sentences (57) and (58) characterize \textit{that man} and \textit{John} by the property of sickness, rather than just attributing that property to them. This characterization is, of course, made within some relativized universe. In the actual discourse the universe is explicitly or implicitly delimited, so that the characterization takes place within those limits (which may be vacuous, i.e., the relativized universe may coincide with the whole universe). Let us give an example. Assume that a doctor is called, and when he comes he finds three people, \textit{John}, \textit{Bill}, and \textit{Tom} lying in bed. He then wants to know which one of them is sick. When his question is answered, the relativized universe includes only the three people in bed. If the answer is (58), then \textit{John}, but neither \textit{Bill} nor \textit{Tom}, is sick. If, on the contrary, \textit{John} and \textit{Bill} are sick, but not \textit{Tom}, the answer should be:

(63) \textit{John-to Bill-ga byocki-da.}

\textit{John and Bill} are sick.

On the other hand, if the doctor is given (60) as an answer, then he knows that \textit{John} is sick, but he gets no information about the other two.

The following two sentences can replace (58) and (63), respectively:
(64) byooki-na-no-wa John-da.
    The one who is sick is John.

(65) byooki-na-no-wa John-to Bill-da.
    Those who are sick are John and Bill.

These forms can be considered as derived from (58) and (63) by a transformation, but we will not discuss that transformation here.

As another example one may say:

(66) ningen-ga hane-no-na-i ninon-asi-no doobucu-da.
    man       feather-not two-leg       animal
    A man is a featherless biped.

characterizing human beings by that property. In this case one may say that the relativized universe of the characterization coincides with the whole universe, and in this sense (66) may be taken as a generic statement.

4. Thus, there is a third kind of judgment, which we shall call characterization. The wa-phrase and ga-phrase serve syntactically to distinguish predicational judgment not only from nonpredicational description but also from characterizational judgment. In English stress may be used to indicate a characterizational judgment; in the English translations of (57), (58), and (63), stressing the underlined words may make the sentences characterizations. But the semantic effects of stress are varied and vague, and one would hesitate to say that in English characterizational judgments are separated from predicational judgments syntactically by means of stress. It is not clear that if John and Bill are both sick, the answer:
with stress on John, is necessarily a wrong answer, while in Japanese the characterizational judgment (58) is clearly wrong in this situation. It therefore seems best to say that in English a characterizational judgment is a possible special reading of a sentence which generally represents a predicational judgment.

It is important to add that a characterization, either specific or generic, seems to presuppose a linguistic or extra-linguistic context. Most explicitly this context is expressed by an interrogative sentence to which the characterization is an answer. Thus,

\[(68) \quad \text{dare-ga byooki-ka?} \]
\[\text{Who is sick?} \]
\[\text{and} \]
\[(69) \quad \text{nani-ga hane-no-na-i nihon-asi-no doobucu-ka?} \]
\[\text{What is a featherless biped?} \]

would provide such a context for characterizations (58) and (66), respectively. Thus, although it is a generic statement, characterization (66) is difficult to conceive of as an isolated discourse, while the generic sentence:

\[(70) \quad \text{nningen-wa hane-no-na-i nihon-asi-no doobucu-da.} \]
\[\text{A man is a featherless biped.} \]

does not sound unnatural even in complete isolation.

The characterizational judgment is distinguished from the predicational judgment by means of the ga-phrase, but it is then confused syntactically with the nonpredicational description, which is also represented by the ga=phrase. It is claimed here that actually the distinction between a character-
ization and a description in Japanese is not syntactic but semantic. That is, a sentence with a ga-phrase as the subject is, in general, semantically ambiguous. However, as is often the case with distinctive notions in semantics, while there are certainly cases in which the distinction is clear, there are also borderline cases in which the notions of characterization and description seem to fuse. In the most typical case, the description seems to presuppose a physical context, which is the object of the description. However, this physical context may well be confused with a mental context, which would be the context of a characterizational judgment. In particular, when the tense of the sentence is past, the physical context is actually set up only as a mental image. Thus, given the sentence:

(71) John-ga kinoo maci-kado-ni tat-te i-ta.
John was standing at the corner of the street yesterday.

one may argue as to whether this is meant to be a description or a characterization of John with respect to a suitably delimited universe. But from a syntactic viewpoint this confusion in semantics is not a crucial problem; rather, it helps us to understand why the syntactic line is drawn between predicational judgment and characterizational judgment rather than between characterizational judgment and nonpredicational description.

Special syntactic contexts may of course disambiguate the semantic ambiguity. Thus, it is reasonable to view copulative or adjectival sentences such as (58) as judgments just as (60) is.
Indeed, copulative sentences are in general judgments, whether predicational as in (60) or characterizational as in (58). However, there are apparent exceptions to this. For instance, seeing the sky redden with an evening glow, one may say:

(72) sora-ga aka-i
sky red

The sky is red.

This would not be considered a characterization of the sky in some relativized universe; it should, rather, be thought of as a description of a situation, if a choice between the two must be made. Probably a description is possible with the noun sky and the adjective red because one understands that color with respect to the sky is a changing condition. It is assumed, however, that no nonspecific indefinite noun can be the subject of any adjectival or copulative sentence. 6

5. It was stated above that in English a nonpredicational description cannot undergo sentence negation, and there is no description like:

(73) *A man is not standing.

Similarly, seeing a man sitting on a chair, one cannot say:

(74) *hito-ga tat-te i-na-i.
man stand not

*Man is not standing.

This does not imply that a sentence with a _ga_-phrase subject cannot be negative. Thus, if someone asks who is not coming to a party, the following is a possible answer:

(75) John-ga ko-na-i.
come-not

John is not coming.
Strictly this answer implies that John, and only John, is not coming; it is a negative characterizational judgment. However, it is difficult to interpret every negative sentence with a ga-phrase subject as a characterization. Assume that we are going to see John, who is supposed to be sick in bed, and that upon entering his room we find, to our surprise, that his bed is empty. We would then say:

\[(76) \quad \text{a, John-ga ne-te i-na-i.}\]
\[\quad \text{oh, sleep (lie) not}\]
\[\quad \text{Oh, John is not in bed.}\]

In some sense this is not strictly descriptive, since, when the sentence is uttered, the image of John lying in bed has already been prepared in the speaker's mind. It can be said that (76) presumes a relativized universe including only John. This is different from the situation in which one finds John standing at the corner of the street and describes the scene with sentence (51). However, (75) can be replaced by:

\[(77) \quad \text{ko-na-i-no-wa John-da.}\]
\[\quad \text{The one who will not come is John.}\]

while (76) cannot be replaced by:

\[(78) \quad \text{ne-te i-na-i-no-wa John-da.}\]
\[\quad \text{The one who is in bed is John.}\]

Accordingly, it would seem better to regard (76) as a description rather than a characterization. (However, sentence (76), disregarding the initial interjection, could be a characterization, and form (78) itself is grammatical.) It is suspected, however, that no specific indefinite noun can be the subject of a negative description nor the subject of a judgment; if a
negative sentence has a  **ga**-phrase as the subject, the subject is probably either definite or nonspecific. It is assumed that the above observation also holds in English, so that while (73) is not grammatical, one may say

(79)  Look, John is not standing there!

If the subject of a sentence is understood to be generic, the sentence is a judgment, not a description. Form (66) is an example of a generic characterizational judgment, and (70) is an example of a generic predicational judgment. Since in Japanese the distinction between definiteness and indefiniteness is not necessarily made syntactically, it may not be completely appropriate to make an analogy between a generic noun as found in (66) and (70) and logical variable. Probably, one would prefer to consider a noun in a generic use as denoting a class or a category of objects. Thus, for example, a structurally more faithful translation of (70) would be

(80)  Man is a featherless biped.

However, it is certainly possible to make a generic, or, more generally, a nonspecific statement with a constituent corresponding to an English determiner. For instance,

(81)  ningen-wa dare-demo hane-no-na-i nihon-asi-no
doobucu-da.

man whoever featherless biped animal

Every man is a featherless biped.

Existential judgments generally involve some determiner.

A possible translation of (33) would be:

(82)  kono-heya-ni i-ru dare-ka-ga eigo-o hanas-u.
this-room be someone English speak

Some men in this room speak English.
We shall not give a detailed discussion of the existential judgment in Japanese here, since this would require an explanation of the determiner system.

6. It has been stated that the *wa*-phrase is the subject of a predicational judgment and the *ga*-phrase is the subject of either a characterizational judgment or a nonpredicational description. However, the use of the *wa*-phrase extends further than the usual concept of subject and must therefore be discussed from a broader viewpoint.

In the sentence:

(83) ano-hon-wa John-ga kat-ta.

that book buy

John bought that book.

a *wa*-phrase translates the English object that book. The English equivalent here, however, does not help to clarify the effect of the *wa*-phrase, since the same English sentence could also be used as a translation of the following:

(84) John-wa ano-hon-o kat-ta.

John bought that book

(85) John-ga ano-hon-o kat-ta.

John bought that book.

Sentence (84) is a predicational judgment, as is sentence (83). The difference is that the premise of the predication in (83) is syntactically the object of the verb; the meaning of (83) may be approximated in English by such sentences as:

(86) If you mean that book, John bought it.

(87) As for that book, John bought it.

(88) That book, John bought.
At this point, it becomes necessary to distinguish clearly the notion of subject of the sentence from the notion of premise of the predicational judgment. Up to now we have been saying that the wa-phrase is the subject of a predicational judgment; however, this did not lead to confusion simply because the wa-phrases in question represented the syntactic subject of the sentence and the logical premise of the predicational judgment at the same time. Example (83) now shows that these two notions are independent, since there the wa-phrase represents the logical premise of the predicational judgment but the syntactic object.

The nouns with wa that can represent the premise of the predicational judgment are not limited to subjects and objects. Virtually all nominal constituents, i.e., noun phrases followed by a particle, may be the premise of the judgment. Even modifying (relative) clauses may be the premises of judgments, but in the present discussion we will restrict ourselves to primary constituents. Thus, we may have the following sentences:

(90) John-ni-wa Bill-ga ano-hon-o okur-u.

that-book send

To John Bill will send that book

(91) niciyoo-ni-wa gakkoo-ga na-i.

Sunday school not

On Sundays there is no school.

(92) Nihon-ni-wa kankoo-kyaku-ga oozei ku-ru.

Japan tourist many come

To Japan many tourists come.
Often the subject is missing but can be understood appropriately:

(93) \( \text{Niciyoo-ni-wa New York Times-o yom-u.} \)

Sunday read
On Sundays (I) read the New York Times.

(94) \( \text{ohasi-de-wa gohan-o tabe-ru.} \)

chopsticks meal eat
With chopsticks (we) eat.

Those sentences are to be taken as predications about John, Sunday, (91) etc., which function as indirect object, time adverbial, etc. A sentence may have two or more wa-phrases:

(95) \( \text{John-wa niciyoo-ni-wa New York Times-o yom-u.} \)

Sunday read

In this case both John and Sunday are to be taken as the premises of the judgment. No significant alteration in meaning occurs as the result of the interchange of the two premises:

(96) \( \text{Niciyoo-ni-wa John-wa New York Times-o yom-u.} \)

It is now clear that the particle wa superimposes the semantic function of the premise of predication on various nominal constituents.

7. Let us now go back to sentence (84) as typical predicational judgment and observe it from a different point of view.

Consider the following sentence:

(97) \( \text{Bill-wa ano-hon-o kaw-anakat-ta.} \)

that-book buy-not
Bill did not buy that book.
This represents negative predicational judgment about Bill.

This may be conjoined with (84) in the following way:

(98) John-wa ano-hon-o kat-ta-ga,
John bought that book, but
Bill-wa (ano-hon-o) kaw-anakat-ta.
Bill did not buy (that book).

But we may also have the sentence:

(99) John-ga ano-hon-o kai-wa si-ta-ga,
Bill-ga ano-hon-o kai-wa si-nakat-ta.

Sentences (98) and (99) may be considered to paraphrase each other, and it is reasonable to assume that they are generatively related in some way. (98) appears to be a compound sentence consisting of the following two sentences combined by the conjunction ga ("but"): (100) John-wa ano-hon-o kat-ta.
(101) Bill-wa ano-hon-o kaw-anakat-ta.

According to the explanation in the preceding sections, (100) and (101) are predications on John and Bill, respectively.

Then, (98) may be regarded as a combination of the two predications by means of the conjunction ga. (99), on the other hand, appears to consist of the following two sentences combined by ga: (102) John-ga ano-hon-o kai-wa si-ta.
(103) Bill-ga ano-hon-o kai-wa si-nakat-ta.

Then, if the compound sentences (98) and (99) were paraphrasable component-wise, (102) and (103) would have to be regarded as predications on John and Bill, respectively. But that this is untenable may be seen immediately from the fact that John and Bill are not marked at all in (102) and (103) and hence it is not
indicated that they (and not the object ano-hon) are the premises of the predication. Thus, we must give additional attention to the semantic and syntactic nature of sentences (100) – (103) and of their relation in (98) and (99).

Let us notice that (102) can also be found in the compound sentences like the following:

(104) John-ga ano-hon-o kai-wa si-ta-ga,
John bought that book, but
(John-ga) kono-hon-o kai-wa si-nakat-ta.
(John) did not buy this book.

While in (99) the component sentences share the same object and verb but have different subjects, in (104) the component sentences share the same subject and verb but have different objects. Just as (99) is paraphrased by (98), in which wa is attached to the distinctive terms John and Bill, (104) can be paraphrased by the following form (105), in which wa is attached to the distinctive terms ano-hon and kono-hon:

(105) John-ga ano-hon-wa kat-ta-ga,

(John-ga) kono-hon-wa kaw-anakat-ta.

Furthermore, (102) can appear in compound sentences such as:

(106) John-ga ano-hon-o kai-wa si-ta-ga,
John bought that book, but
Bill-ga kono-hon-o kai-wa si-nakat-ta.
Bill did not buy this book.

and

(107) John-ga ano-hon-o kai-wa si-ta-ga,
John bought that book, but
Bill-ga kono-hon-o uri-wa si-nakat-ta.
Bill did not sell this book.

Neither the subject nor the object is shared by the component sentences in (106), and furthermore in (107) the verb is not shared, so that the component sentences are totally independent. In all of the forms (99), (104), (106), and (107), the particle *wa* serves to contrast two component sentences. But in (99) and (104), the contrast is concentrated on the subject and the object, respectively, and the positioning of the particle *wa* in (98) and (105) emphasizes this fact. The first and second component sentences of (99), i.e., (102) and (103), can each be used as an independent sentence, in which case they imply not only the facts:

John bought that book.

and

John did not buy that book.

respectively, but also that these facts are put in contrast with some other facts, which in actual discourse contexts may or may not be linguistically explicit. Thus, it can be noted that the situation here with respect to *wa* is quite similar to the situation noted in Chapter I with respect to *even* and *also*. We can then assume that (102) and (103) have the basic representations:

(110)  John-ga ano-hon-o kat-ta wa.

(111)  Bill-ga ano-hon-o kaw-anakat-ta wa.

and that (100) and (101) are derived from these forms by
attaching wa to John and Bill, respectively. Indeed, sentences such as (100) and (101), which have been considered to be predicational judgments, can be regarded as being related to basic forms like (110) and (111) in the same way that sentences like (112)

(112) Even John bought that book.

(where even is assumed to be attached to the subject) are described in Chapter I as being related to basic forms like:

(113) Even - (John)_{NP} - (bought that book)_{VP}

In other words, (112) implies, however vaguely, a sentence of the form:

(114) Someone bought that book.

which is supposedly put in contrast with (112), so (100) can be assumed to refer in some sense to the sentence of the form

(115) X-wa ano-hon-o kaw-anaka-ta.

Actually, this reference to a "shadow partner" is, in general, even vaguer here than in the case of even. Of course it could be made definite in certain discourse contexts so that it could specifically mean, say, (111). In general, however, the best we can say is probably that proposition (115) with unspecified X is implied in (100) as a possible supplementary statement. But, after all, this does not seem incompatible with the nature of predicational judgment. Looking at the predicational judgment:

(116) John bought that book.

or, put into the model form of (4):

(117) If you mean John, he bought that book.

It may be said that this judgement itself implies that one
is not making any judgment on anyone else, and hence the possibility of someone else not buying that book is left open. In Japanese this can be made quite explicit in certain discourse contexts, especially with a heavy stress on wa.

The following generative rules will now be introduced to account for the wa-phrase in the simple sentence:

(118) Sen → S -wa
(119) wa-Attachment

\[(X - NP - Y)_S - wa \rightarrow (X - NP+wa - Y)_S -wa\]

(120) wa-Deletion

\[(X - NP + wa - Y)_S - wa \rightarrow (X-NP+wa - Y)_S\]

(121) si-Insertion

V - Aux - wa → V - wa - si - Aux

(122) wa-Phrase Inversion

\[## X - NP - wa \rightarrow ## NP - wa - X\]

where X is not X'-NP-wa

Rule (118) is a phrase-structure rule that will generate the basic form of the sentence with the wa-phrase. By wa-Attachment (119), the sentence-final wa may be attached to a constituent NP. This attachment rule may be repeated so that a sentence may contain more than one wa-phrase. If wa is attached to some constituent(s), the sentence-final wa will be deleted by wa-Deletion (120). If wa remains in the sentence-final position, by si-Insertion (121) it will be incorporated into the verb and the empty verb si will be inserted to carry Aux. By wa-Phrase Inversion (122), the wa- (noun) phrases will be gathered in the sentence-initial
position. _Wa-Attachment is optional, and _si-Insertion is obligatory. We will assume that _wa-Deletion and _wa-Phrase Inversion are (unconditionally) obligatory.8

It seems necessary here to reexamine the semantic significance of the particle _wa, which, up to this point, has been taken as the premise marker. The premise of a predication is, to be sure, expressed in a _wa-phrase, and in this sense one may say that the particle _wa serves to mark the premise. But, as has been noted, the status of the _wa-phrase as the premise is not established within the phrase structure; rather, the _wa-phrase is generated transformationally by attachment. Thus the role of the premise marker is not inherent in the particle _wa, but is secondarily imposed on it by the transformational mechanisms of compounding and attachment. Indeed, inasmuch as (99) is considered to be synonymous with (98), John and Bill in (99) should be regarded as the premises of the (component) predications just as they are regarded in (98). But John and Bill in (99) are not in a _wa-phrase; it should be assumed that their premise status derives rather simply from the fact that they are put in contrast in compounding. Then the same should be true in (98), and the role of _wa as the premise marker seems to be reduced to being of secondary origin. In simple sentences like (100), there is no clue other than the particle _wa to indicate that John is the premise. But if the attachment of _wa in simple sentences like (100) should be considered to differ from its attachment in compound sentences like (98) only in that the partner in compounding is implicit, then the primary semantic role of the attachment of _wa may
have to be taken as indicating the structure of compounding, meaning that the premise status of the wa-phrase then becomes a secondary consequence. At any rate, it is clear that the generative, syntactic nature of the semantic notion of premise is by no means simple and straightforward; the notion of premise as a syntactic notion cannot be phrase-structural, but transformational.

What is semantically inherent in the particle wa is to be abstracted from its effect on sentences like (102, in which it remains at the end, where it was introduced by the phrase-structure rule. Sentence (102) maintains the truth of the fact that John bought that book and at the same time, implies that some other facts, which in some sense contrast with this, did not take place, or, more generally and vaguely, it may imply that the speaker reserves judgment on some other facts. The speaker's contention of the truth of the sentence is therefore strongly and clearly indicated. There is no such indication in the sentence without wa when not conceived of as a characterizational judgment. As a typical example, the sentence:

(123)  hito-ga asoko-ni tat-te i-ru.

A man is standing there.

does indicate that the speaker has perceived a man standing there, but it is an expression of this perception as such and does not specifically indicate any reflection on this perception on the part of the speaker. To be sure, unless the speaker is telling a lie, sentence (123) does represent a true fact, i.e., that a man is standing there. But this would result
merely from the speaker's perception, and is independent of any real claim of truth on his part. Returning to sentence (102), the sentence-final _wa_ may then best be considered as a predicational judgment marker. However, one might well ask what would be taken as the premise and what as the conclusion of this predicational judgment. In the case of (84) it can be said that the term _John_ is somehow contrasted with some other items and therefore that term can be viewed as the premise of the predicational judgment (84). In the case of (102), it is the whole sentence that is somehow put in contrast with some other facts; and by analogy, then, one may say that the whole sentence is the premise of the predicational judgment. Compare the following paraphrases of (84) and (102):

(124) If X is John, that X bought that book is true.
(125) If S is that John bought that book, S is true.

We shall conclude this section with an additional remark on the particle _wa_. The conjunctive particle _ba_ ("if") has been assumed to be historically related to the particle _wa_. (Cf., for example, Sanson (1928), p. 272) It seems reasonable to relate these two particles generatively as well. Thus, it will be assumed that the subordinate (conditional) clause of the sentence:

(126) John-ga ano-hon-o ka-e-ba, Bill-wa kono-hon-o ka-u.

that-book buy-if this-book buy

If John buys that book, Bill will buy this book.

has the same basic form as (94), namely:

(127) (John-wa ano-hon-o ka-u)g - _wa_.

As stated previously, this basic form maintains the truth of the proposition "John buys that book" against some other propositions which are, implicitly or explicitly, put in contrast with it. The conditional meaning is superimposed on this when (127) appears as a conditional subordinate clause in (126).

8. In this chapter, we first described the semantic difference between the wa-phrase and the ga-phrase as the subject of a sentence and then turned our attention to the more general use of the wa-phrase. We have seen that we must distinguish between the concepts of the subject of a sentence and the premise of a predicational judgment. In English (and in Indo-European languages in general) there is no explicit syntactic device to distinguish these two notions, and in most cases they are confusingly represented by the so-called subject of the sentence.

In some English cases, however, the premise of a predication does seem to be separated syntactically from the subject of a sentence, although this depends on one's conception of the subject. Thus, grammarians of various schools of thought have talked about the distinction between the grammatical subject and the logical or real subject, or the distinction between the underlying and the derived or surface subject. In sentences in which these two kinds of subjects are distinguished, the grammatical or surface subject seems to serve to indicate the premise of the predication. For instance, take the following examples:
(128) Someone reads every book.
(129) Every book is read by someone.

In the natural reading of these sentences, they seem to talk about someone and every book in (128) and (129), respectively. Thus, every book is the premise of the judgment expressed in (129) but not in (128). If it is admitted that every book is not the underlying or real subject in (128), then this can be taken as a case where the subject of the sentence and the premise of the predication are not the same.

In such pairs as:
(130) Cats eat rats.
(131) Rats are eaten by cats.

there is no difference in logical meaning in the two sentences, but, as linguistic expressions, one may say that the former is about cats while the latter is about rats, and in that sense the premise of the judgments in (130) and (131) are cats and rats, respectively.

Furthermore, some linguists claim that the window in
(132) The window broke.
is not the subject; the grammatical relation of the window to the verb broke is the same in (132) as in
(133) Someone broke the window.
(The particular choice of the subject someone has no bearing on our present problem.) Yet one may still say that sentence (121) is about the window. Even more interesting is the following case with the same verb:
(134) Every cup will break.
This is a judgment about every cup, but one cannot express this
judgment in the natural reading of a sentence with a real subject. The sentence:

(135) Someone will break every cup.

is not about every cup, in the natural reading, and is logically different from (134). If one assumes that the intransitive construction as in (134) is derived by some transformation from the transitive construction, this transformation, together with the passive transformation, can be said to make it possible in English to assign the status of the premise of predication to the object.

In this sense, the notion of surface subject suitably defined in English represents the notion of premise as reflected in Japanese in the sentence-initial wa-phrase. However this structural correspondence between the surface subject and the wa-phrase is only partial. Actually, nonpredicational descriptive sentences can also undergo these transformations in English so that the surface subject may not necessarily be a premise. Compare the following pairs of sentences in English and Japanese:

(136) A cat is eating a rat.
(137) A rat is being eaten by a cat.

and

(138) neko-ga nezumi-o tabe-te i-ru.
    cat   rat    eat
A (or the) cat is eating a (or the) rat.

(139) nezumi-wa neko-ga tabe-te i-ru.
    rat    cat    eat
The rat is being eaten by a (or the) cat.
In English, (136) and (137) are synonymous, and both are nonpredicational. But in Japanese, (139) is not a nonpredicational description, and nezumi ('rat') cannot be taken to be indefinite specific; it is the premise of the predication represented by (139).

Furthermore, not only the subject and object but other nominals as well can appear as wa-phrases. In English, on the other hand, the noun phrases that can be understood as the surface subject are much more restricted; time or place adverbial noun phrases rarely move into the position of the surface subject. Compare, for example, the following Japanese sentences and their English translations:

(140) sakana-wa ike-ni sun-de i-ru.

fish pond live

Fish live in ponds.

(141) ike-ni-wa sakana-ga sun-dei-ru.

In a pond live fish.

Sakana and ike are the premises of predications (140) and (141), respectively. The English sentence given in (141) can be read as a predication on pond (i.e., with the premise pond), but the premise status of pond is not as definite as that of ike in the corresponding Japanese sentence. At any rate, it cannot be said that pond is the surface subject of that English sentence.

However, some examples can be found in which place or time noun phrases may be considered to be surface subjects. Well-known examples of this sort are:

(142) Yesterday is when he came.

(143) New York is where he came from.
But this device is not a general one, so that one would not say:

(144) Every Sunday is when someone reads the New York Times.

intending to mean


In connection with this, it may be interesting to note the use of *there* as in

(146) There are three men in this room.

(147) There are some misprints in every book.

On the one hand, these sentences can be regarded semantically as judgements on *this room* and *every book*. Note, in particular, that in the preferred reading of (147) the order of the two quantifiers is the reverse of the order in the corresponding logical formula, while in most preferred readings these two orders coincide. Indeed, the preferred reading of (147) is the same as (148):

(148) In every book there are some misprints.

On the other hand, it has been proposed to take *there* in such sentences as (146) and (147) to be the surface subject. There is some syntactic similarity between this *there* and the surface subject, so that one says, for example:

(149) John expected there to be three men in this room.

(150) John expected there to be misprints in every book.

Thus one may say that *there* is a dummy surface subject representing the noun phrase in a place adverbial. Then such sentences as (146) and (147) can be brought into the general case of surface subjects assuming the role of logical premise.

At any rate one can say that in English there is no general and consistent syntactic mechanism by which the premise of a
predication is brought into the surface subject. Then, some other device may be employed, case by case, to indicate the premise. One common device of this type is the word order change found in the English translation of (141), although the first phrase (i.e., in a pond) will not be assigned the status of premise unambiguously. If a precise statement is demanded, a periphrastic paraphrase like the following is necessary:

(151) For every pond there exists some fish that lives there.

Thus, there is no syntactic device in English that really corresponds to the Japanese wa-Attachment. But both languages seem to point to the logical notion of premise not being grammatically realized solely within the phrase-structural scheme.
FOOTNOTES

1 One may also think of (7) as having existential import, in which case its reformulation in (8) would be preceded by:

   God exists, and...

More generally, (4) would be replaced by:

   A exists, and...

Substituting the above for (8) and (4), respectively, will not affect our discussion, and we shall continue to assume forms like (8) and (4) as originally stated.

2 The adjective nonpredicational in the term nonpredicational description is superfluous in the sense that we will not introduce the notion predicational description. However, the simple term description may be mistaken to mean a description about the subject of the sentence, in which case the description reduces to a predication about the subject. To avoid this and to keep the distinction between predication and description in our sense, the adjective nonpredicational will generally be added.

3 This is logically quite natural. When one uses an indefinite noun to refer to an object, one conceives of that object as an arbitrary representative of the category denoted by that noun. If one makes a predication on that object, one is attributing a property to an arbitrary member of the category. Thus a sentence with an indefinite subject can be a predication
only if it is taken as a generic statement, and then the subject is not taken to be specific.

4Thus, the sentence:

A man is sick.

is possible, for example, in the context:

Please come; a man is sick.

5In footnote 4 the English sentence

A man is sick.

was said to be acceptable in certain circumstances. But the Japanese counterpart, (53), seems unnatural even in those contexts.

6Apparent exceptions would be sentences such as:

nihon-zin-ga kono-kaisya-no syacyoo-da.

Japanese this-company president.

A Japanese is the president of this company.

But, although we will not go into detail here, it is probably reasonable to consider this form to be derived from:

kono-kaisya-no syacyoo-wa nihonzin-da.

The president of this company is a Japanese.

7(96) may be paraphrased as:

If someone is John, and if a day is Sunday, he reads the New York Times on that day.

8This assumption seems reasonable in the early steps of a description of Japanese syntax. But this means that such sentences as

Jonn-wa kyoo ano-hon-wa yon-da.

will not be generated within our scheme. Furthermore, the
sentence-final **wa** in such forms as:

Ano-hon-wa John-ga yomi-wa si-nakat-ta.

should probably be explained as not having undergone **wa**-Deletion.

It is quite natural to assume that detailed contextual specifications will be added to the rules given above as the description of Japanese syntax progresses.

9See Hall (1965).

10E. S. Klima, in lectures on the Structure of English given at MIT.

11Various constituents can be brought to the **primary** position in so-called cleft sentences, and one might then assume that the cleft sentence transformation corresponds to the **wa**-Attachment rule. However, it seems that the cleft sentence expresses a characterizational judgment rather than a predicational one. Thus, the cleft sentence:

It is John who bought that book.

is translated by

ano-hon-o kat-ta-no-wa John-da.

which in turn is considered to be derived from the characterizational reading of:

John-ga ano-hon-o kat-ta.

Compare, further, sentences like

God is just.

and

It is God who is just.

12The reader familiar with Japanese will note that **wa** may also be attached to nonnominal constituents such as modifiers
of noun phrases, adverbs and verbs; throughout this work, however, we are concentrating primarily on nominal phrases (or, more specifically, subjects and objects). It is quite probable that many of the transformations introduced here will be generalized as the description of Japanese is expanded.
Chapter III  \( \text{mo, demo, and ka} \)

1. In Chapter II the particle \( \text{wa} \) was interpreted as being generated at the end of the sentence by the phrase structure and then attached to various nominal constituents by transformation. This chapter will deal with the particles \( \text{mo} \) and \( \text{demo} \), which seem to be like \( \text{wa} \) in this regard, and with the particle \( \text{ka} \), which has related attachment characteristics. The particle \( \text{mo} \) will be discussed first.

Let us look at the following examples:

(1) \( \text{John-ga hon-mo zassi-mo kat-ta.} \)
    book  magazine buy
    John bought both books and magazines.

(2) \( \text{John-mo Bill-mo hon-o kat-ta.} \)
    Both John and Bill bought books.

(3) \( \text{John-ga niciyoo-ni-mo doyoo-ni-mo hon-o kat-ta.} \)
    Sunday    Saturday    book    buy
    John bought books both on Sunday and Saturday.

In (1) \( \text{hon} \) and \( \text{zassi} \) are objects and in (2) \( \text{John} \) and \( \text{Bill} \) are subjects of the verb \( \text{kat-ta.} \) The object marker \( \text{o} \) and the subject marker \( \text{ga} \) are not obvious in these sentences, but this is the result of the morphophonemic rule which deletes \( \text{ga} \) and \( \text{o} \) before \( \text{mo} \). The other particles are generally preserved, as seen in (3), where \( \text{ni} \) actually appears before \( \text{mo} \).
Semantically it is clear that these sentences involve two sentences. Thus, for example, (1) contains

(4) John-ga hon-o kat-ta.
John bought books.

and

(5) John-ga zassi-o kat-ta.
John bought magazines.

A similar breakdown can be made for (2) and (3). Let us now look into the question of the generative relation between such a breakdown and the sentences (1) – (3).

Two sentences can generally be combined by means of *mo* in the way illustrated in the following example:

(6) John-ga hon-o yomi-mo-si, Bill-ga rekoodo-o kiki-mo si-ta.
book read record listen to
John read books and Bill listened to records.

If sentences (4) and (5) are combined in the same way, the result is:

John bought books, and (John) bought magazines.

Sentence (7) has the same meaning as (1), and it is reasonable to connect (1) generatively to (7). That is, (7) will be assumed to be the underlying form of (1), from which (1) is derived by combining and "shortening." Similarly, the underlying forms of (2) and (3) are respectively,

(8) John-ga hon-o kai-mo si, Bill-ga hon-o kai-mo si-ta.
John bought books and Bill bought books.

and
(9) John-ga niciyoo-ni hon-o kai-mo si, (John-ga) doyoo-ni hon-o kai-mo si-ta.
John bought books on Sunday and (John) bought books on Saturday.

Thus it is reasonable to suppose that the particle mo in sentences (1) - (3) is not originally, i.e., phrase-structurally, found in the position in which it appears there.

Mo does not appear only with obvious pairs. Sentences like the following are very common:

(10) John-ga hon-mo kat-ta.
John bought books (and some other things).

(11) John-mo hon-o kat-ta.
John (and some other persons) bought books.

(12) John-ga niciyoo-ni-mo hon-o kat-ta.
John bought books =n Sunday (and on some other days).

The introduction of "shadow sentences" with a dummy would allow (10)-(12) to be generated in a way parallel to sentences (1)-(3). For example, the underlying form of (10) could be assumed to be

(13) John-ga hon-o kai-mo si, John-ga D-o kai-mo si-ta,
where D represents the dummy. This would result in

(14) John-ga hon-mo D-mo kat-ta.

From which the phrase containing the dummy D would be deleted to yield (10).

However, we will use attachment instead of a dummy and take the following as the basic form of (10) and (11):

(15) (John-ga hon-o kat-ta)-mo.

Sentences (10) and (11) are then derived from (15) by an attachment transformation that attaches mo to the constituent hon-o or John-ga. It is also possible for sentence-final mo
in the basic form (15) not to be attached to any noun phrase. Then, like the particle *wa*, *mo* will be incorporated into the verb (stem), and the empty verb *si* will be introduced to carry the auxiliary. This will yield the speech form:

(16) John-ga hon-o kai-mo si-ta.

John bought books (and some other things happened). Semantically we can say that the attachment transformation makes (10) and (11) more specific than (15) (or (16)). In other words, (10) and (11) can be said to imply (16) semantically.

Formally, the *mo*-Attachment and *mo*-Deletion rules would be stated as follows:

(17) **mo-Attachment**

\[(X - \text{NP} - Y) - \text{mo} \rightarrow (X - \text{NP+} \text{mo} - Y) - \text{mo}\]

(18) **mo-Deletion**

\[(X - \text{NP+} \text{mo} - Y) - \text{mo} \rightarrow (X - \text{NP+} \text{mo} - Y)\]

Actually the attachment of *mo* to a particular constituent can be more vague semantically than would be expected. For instance, the sentence

(19) musuko-mo daigaku-ni hait-ta.

son college enter

(His) son entered college.

does not necessarily imply that some other person also entered college. In the compound sentence
(20) (zyuunen tat-te) musuko-mo daigaku-ni hairi, ten years pass son college enter
(Ten years passed and) his son entered college
musume-mo yome-ni it-ta. daughter marry
and his daughter was married.

What is involved is not that the son entered college with someone else or that the daughter and someone else were married, but rather that the two events - the son's entering college and the daughter's marrying - occurred together. Thus the logical meaning of (20) is that of its basic form:

(21) (zyuunen tat-te) musuko-ga daigaku-ni hairi-mo si, musume-ga yome-ni iki-mo si-ta.

Sentences like (19) and

(22) musuko-ga daigaku-ni hairi-mo si-ta.

can certainly be used as independent sentences, and, when they are, the precise semantic result of the mo-attachment may not be immediately evident.

Note that the sentence-final mo of (21) is attached in (20) to the subjects of the two component sentences even though the components do not represent two identical sentences except for different subjects. This is not only true when mo is attached to subjects. It may also be attached to objects even if the component sentences are not identical except for different objects. Thus, changing the verb in (20) from intransitive to transitive, we have
(23) (zyuunen tat-te) musuk-mo daigaku-ni ire,
(Ten years passed and ) he sent his son to college
musume-mo yome-ni yat-ta.
and married off his daughter.

2. It is difficult to give a tag translation for the
particle demo. It can be equivalent to the English word even
as in:

(24) John-demo hon-o kat-ta.
Even John bought books.

However, demo does not mean "even" in the most natural reading
of the imperative sentence in (25), for example:

(25) hon-demo yon-de i-nasai.
Be reading books or something.

Here demo adds to the word hon ("book") a nuance that books are
one possible choice among some other things. But there is some
semantic constant shared by both uses of the particle demo.

When one says even John, John is put in contrast with some
other persons; furthermore, John is conceived of as one of the
last choices one would expect. Thus, although one English word
or phrase may not always be used as a tag translation of this
particle, it is assumed that there is one syntactic item
throughout. Polarization of the nuance "among other persons or
things" is assumed to be determined by the particular context
of the demo-phrase, but this semantic problem will not concern
us here.

The particle demo, like wa and mo, can be attached to the
whole sentence. Here, again, the particle appears after the
verb and the empty verb **si** is inserted:

(26)  **ame-ga huri-demo si-ta-no-daroo.**

rain  fall

It seems that it rained or something.

The attachment of **demo** to the subject **ame** will not basically alter the meaning of this sentence.

(27)  **ame-demo hut-ta-no-daroo.**

Likewise we assume that the form:

(28)  **(John-ga hon-o kat-ta)-demo.**

is the basic form of (24). In this case, however, the form directly derived from (28):

(29)  **John-ga hon-o kai-demo si-ta.**

may not be taken, in a natural reading, as meaning

(30)  **Even such a thing as that John bought books happened.**

But it will still be assumed that the phrase-structural basic form of (24) is (28), and, if necessary, we will say that the **demo**-attachment rule is obligatory to obtain the meaning of "**even.**" This situation undoubtedly arises from the vagueness of the range of meaning of **demo** as mentioned above. It should be noted that **datte**, the colloquial variant of **demo**, invariably means "**even,"** and the form corresponding to (29)

(31)  **John-ga hon-o kai-datte-si-ta.**

is quite natural and means (30). In more formal style, **demo**, when it means "**even,"" can be replaced by the particle **sae**, and then again the form corresponding to (29):

(32)  **John-ga hon-o kai-sae si-ta.**

clearly means (30). Thus, with the particles **datte** and **sae**, the semantic relation between (31) and (32) and the forms generated from them by attachment may more clearly be seen:
(33) John-datte hon-o kat-ta.
Even John Bought books.

(34) John-sae hon-o kat-ta.
Even John bought books.

The occurrence of two particles demo (or datte or sae) in one sentence sounds unnatural:

(35) *John-demo hon-demo kat-ta.
Even John bought even books.

We will therefore assume that sentence-final demo may be attached to one, but not more than one, constituent.

The following represents the demo-Attachment rule.

(36) demo-Attachment

\[(X - NP - Y)\text{-demo} \rightarrow (X - NP + \text{demo} - Y).\]

In Chapter II the particle wa was related to the conditional conjunction ba; conditional clauses ending in ba are assumed to be sentences with wa subordinated. With regard to demo, there is a concessive conjunction which appears phonetically as temo/demo. It is supposed that this conjunction is generatively the same as the particle demo we have been dealing with. Within a temo/demo-clause, demo cannot be attached to a nominal phrase. One may say:

call answer not

Even though John called Bill, Bill did not answer.

One would not say:

(38) *John-demo Bill-o yon-demo, Bill-wa kotae-nakat-ta.

But by using another concessive conjunction, noni, the following
is possible:


Though even John called Bill, Bill did not answer.

It is fair to assign the translations "even if," "even though" to the concessive conjunction temo/demo, and "though" to noni. Thus, formally as well as semantically, there is enough motivation to suppose that the underlying form of the concessive temo/demo clause is the same as the independent sentence attached to the sentence-final demo. Accordingly, the basic form of the subordinate clause of (37) is assumed to be

(40)  (John-ga Bill-o yob)-demo, ...

Even if John called Bill, ...

Later, when the indeterminate pronouns are discussed, further formal evidence will be given for this.

3. The particle ka is equivalent to English "or" in the sentence:

(41)  John-ka Bill-ga hon-o kat-ta.

John or Bill bought books.

This sentence can be paraphrased:

(42)  John-ga hon-o kat-ta-ka Bill-ga hon-o kat-ta.

John bought books or Bill bought books.

In (42) there is a disjunction between the two sentences. (41) will be assumed to be derived from (42) by a common "shortening" device.

On the other hand, (41) can also be paraphrased:

(43)  John-ka Bill-ka-ga hon-o kat-ta.

John or Bill bought books.
Here the particle *ka* is repeated after *Bill*. The generative origin of the second *ka* in (43) is not immediately clear from (42). However, when (42) is put in the *desu*-style, for example, the result is:

\[(44)\quad \text{John-ga hon-o kat-ta-ka Bill-ga hon-o kat-ta-ka-desu.}\]

John bought books or Bill bought books.

Here the particle *ka* is repeated after the second sentence. Thus it is supposed that in the underlying form of disjunction of two sentences, *ka* is repeated after each component sentence. In other words (42) has the basic form:

\[(45)\quad \text{John-ga hon-o kat-ta-ka Bill-ga hon-o kat-ta-ka.}\]

Then the appearance of *ka* after *Bill* in (43) can be explained as the remnant of the *ka* after the second component sentence of the basic form (45). This *ka* will have to be deleted when (42) is derived from (45). Accordingly, the *ka*-Deletion rule is formulated as follows:²

\[(46)\quad \text{ka-Deletion}\]

\[\text{ka}_\text{Sen} \rightarrow \text{Sen}\]

The shortening transformation may apply either before or after this deletion transformation. The one that applies before (46) will be formulated as:³

\[(47)\quad \text{ka-Shortening 1}\]

\[(((X-Y-Z)-ka (X-Y'-Z)-ka)_{\text{Sen}} \rightarrow (X-Y-ka-Y'-ka-Z)_{\text{Sen}}\]

The transformation given below will apply after ka-Deletion (46):

\[(48)\quad \text{ka-Shortening 2}\]

\[(((X-Y-Z)-ka (X-Y'-Z))_{\text{Sen}} \rightarrow (X-Y-ka-Y'-Z)_{\text{Sen}}\]

(It is supposed that *Y-ka-Y'-ka* and *Y-ka-Y* in the right-hand
side of (47) and (48) replace Y in the left-hand side in the derived phrase structure.) Thus, if (47) is applied to (45), we will get (43); if (47) is not applied to (45), then (46) will apply to it and, depending on whether (48) applies or not, we will get (41) or (42).

An actual speech form of a sentence may end in *ka*. Such a sentence will then be either interrogative or exclamatory.

(49) John-ga hon-o kat-ta-ka?
    Did John buy books?

(50) John-ga hon-o kat-ta-ka!
    John did buy books.

One might immediately assume that these two sentences are differentiated in their basic forms by different markers, the question marker Q or the exclamation marker E. Then the following would be the basic forms for (49) and (50):

(51) John-ga hon-o kat-ta-ka-Q.

(52) John-ga hon-o kat-ta-ka-E.

Actually, although we do indeed take (52) to be the basic form of (50), additional considerations are involved in determining the basic form of the interrogative sentence. Note that *ka*-Deletion (46) does not apply to the basic form (52) because of the existence of E, so that *ka* is preserved in the actual speech form (50).

In considering the interrogative sentence, it should be noted that indirect interrogation always takes the form of disjunction. Thus it is not natural to say

(53) *John-ga hon-o kat-ta-ka-no mondai.
Instead one will say

\[(54)\]  
John-ga hon-o kat-ta-ka kaw-anakat-ta-ka-no mondai  
book buy buy-not question  
the question whether John bought books or not

or

\[(55)\]  
John-ga hon-o kat-ta-ka doo-ka-no mondai  
book buy how question  
the question whether John bought books or not

\[(55)\] will naturally be considered a reduced form of \[(54)\], which has, in turn, a more basic representation:

\[(56)\]  
John-ga hon-o kat-ta-ka John-ga hon-o kaw-anakat-ta-ka-no mondai  
the question whether John bought books or John did not buy books

Two disjoined sentences may not necessarily be related affirmatively-negatively as in the above; one may say:

\[(57)\]  
John-ga hon-o kat-ta-ka Bill-ga zassi-o ut-ta-ka-no mondai  
the question whether John bought books or Bill sold magazines

It seems reasonable to suppose, then, that in the basic forms only disjoined sentences can be put in the interrogative. "Yes-no" questions such as \[(49)\], which do not appear to be disjunctive in the actual speech forms, are now assumed to have a special type of disjunction in the basic form, that is, affirmative-negative disjunction. Thus, \[(49)\] is assumed to have the basic form:
((John-ga hon-o kat-ta)-ka (John-ga hon-o kaw-anakat-ta)-ka-Q

This may appear on the surface as


Did John buy books or not?

or, possibly,

(60) John-ga hon-o kat-ta-ka doo-ka.

Did John buy books or not?

But the most common actual speech form of (58) is obtained by deleting the second component of disjunction, resulting in (49). The component sentences of the interrogative disjunction need not bear an affirmative-negative relation. In this case no significant transformation is needed to derive the actual speech form from the basic form. Thus, the basic form:

(61) John-ga hon-o kat-ta-ka Bill-ga hon-o kat-ta-ka Q

will yield:


Did John buy books or did Bill buy books?

Although (45) and (62) appear to have the same form, they are different: (45) is a basic form which is actualized as (41), (42), or (43), while (62) is a speech form which is the actualization of (61). Let us recall further that ka-Shortening rules (47) and (48) refer to the parentheses labeled Sen. Thus, these rules are prevented from applying, in, for example,


where the final ka is separated from the parenthesis labeled Sen.

Thus, the forms

(64) John-ka Bill-ka-ga hon-o kat-ta-ka.
are not actual speech forms of (63) but have the meaning

(66) Did John or Bill buy books? ("yes-no" question)

It follows from our discussion of "yes-no" questions such as (49) that the basic form of (64) and (65) should be assumed to be the disjunction of (45) and its negation, which can be represented as follows:

(67) (((John-ga hon-o kat-ta)-ka (Bill-ga hon-o kat-ta)-ka) Sen -ka)

(((John-ga hon-o kat-ta)-ka (Bill-ga hon-o kat-ta)-ka) Sen -Neg-ka) Q.

Then rules (46) - (48) may affect the second ka in (67) as they may affect the second ka in (45). The deletion of the negative component of the disjunction in (67) will then yield (64) or (65) as actual speech forms. On the other hand, if none of rules (46) - (48) are applied to (67), the result will be:


This form may strike the native ear as strange, but consider the following form which differs from (68) only in stylization:


Notice finally that there is no attachment transformation, like wa-Attachment, mo-Attachment, and demo-Attachment, that attaches ka to the (general) nominal constituent. Thus, we do not have such forms as

(70) *John-ka hon-o kat-ta.

which would be expected to mean
In this respect the particle _ka_ is different from the others already discussed.

However, it will be shown below that _ka_ may be attached to the indeterminate pronouns, and in this respect shares a syntactic characteristic with the particles _mo_ and _demo_. It is for this reason that _ka_ is included in this chapter.

By indeterminate pronouns we mean words such as _dare_, _nani_, _doko_, etc. These are often called interrogatives (or interrogative pronouns), and are equivalent to English "who," "what," "where," etc. The discussion here will clarify why it seems preferable to refer to these as indeterminate pronouns rather than interrogatives. To some extent it is misleading to use the English tag translations given above. But with the reminder that the English words (or, better, morphemes) are not necessarily restricted to the interrogative use (as in the so-called relative and concessive pronouns), the _wh_-words will be used as translations. Indeed, tag translations are to be regarded primarily as a convenience, and their use does not imply perfect structural similarity between the corresponding Japanese and English words. There will be some discussion of the relationship between English _wh_-words and Japanese indeterminate pronouns at the end of this chapter.
4. When **demo** is attached to an indeterminate pronoun, the result is an **every-word**: **dare-demo**, "everyone"; **nan-demo** "everything." We call such words **demo-pronouns**. They can be stronger in meaning than English **every-words** and may sometimes be more closely equivalent to **whenever-words** like **whatever**:

(72) John-ga nan-demo dat-ta.  
John bought everything. (or John bought whatever it might be.)

(73) dare-demo hon-o kat-ta.  
Everyone bought books.

**Demo** attached to an indeterminate pronoun will be viewed in the same way as **demo** attached to a general nominal phrase. Thus, the following basic forms are assumed for (72) and (73):

(74) (John-ga nani-o kaw)-demo
(75) (dare-ga hon-o kaw)-demo

(In the next chapter we will set up forms more basic than (74) and (75), and hence they are actually intermediate. For our purposes here, however, they may be referred to as basic forms.)

In the preceding chapter it was said that **demo** generated by the phrase-structure at the end of a sentence results in the so-called concessive conjunction **temo/demo** when the sentence is subordinated. The generative relationship between this concessive conjunction and **demo** after indeterminate pronouns is evidenced by the fact that the **demo-pronouns** never appear within a **demo-concessive clause**; the indeterminate pronouns are used in their place. Indeterminate pronouns are often regarded as interrogative, but here they appear in sentences where no interrogation is involved. Thus,

(76) dare-ga hon-o kat-temo ...  
Whoever buys books, ...
(77) John-ga nani-o kat-temo ...

Whatever John buys, ....

It is rather difficult to find direct evidence of generative relatedness between _demo_ in the _demo-_pronouns and the sentence-final _demo_ in an independent sentence. However, the following form, which is probably permissible, seems to imply this relatedness:

(78) ano-koro-wa hitobito-wa nani-o tabe-demo si-ta.

that-time people what eat

Around that time people ate whatever it might be.

The form with _demo_ attached to _nani_ sounds better:

(79) ano-koro-wa hitobito-wa nan-demo tabe-ta.

5. We will now turn our attention to words such as _dare-mo_, _nani-mo_, etc., which we will call _mo-_pronouns. These are similar to English "any"-words in that they are used primarily in negative sentences. Thus:

(80) dare-mo hon-o kaw-anakat-ta.

No one bought books.

(81) John-ga nani-mo kaw-anakat-ta.

John did not buy anything.

The generative origin of _mo_ at the end of the sentence is again supported by examples in which _mo_ appears at the end of a negative sentence.

(82) kore-made dare-ga kangae-mo si-nakat-ta aidia

this-till who think do-not idea

the idea which no one has ever thought of
These forms are presumed to be grammatical, although the forms with *mo* attached to dare and nani, respectively, are more natural:

(84)  kore-made dare-mo kanga-nakat-ta aidia
(85)  John-wa nani-mo ka-oo-to si-na-i.

Note that the deletion of *mo* from these forms results in nonsense:

(86)  *kore-made dare-ga kanga-nakat-ta aidia
     *John-wa nani-o yomoo-to si-na-i.

Accordingly, the underlying forms of (80) and (81) might be assumed to be

(88)  (dare-ga hon-o kaw-ana-i)-mo
(89)  (John-ga nani-o kaw-ana-i)-mo

However, there seem to be reasons for regarding the above as intermediate and setting up basic forms with the particle *demo*:

(90)  (dare-ga hon-o kaw-ana-i)-demo
(91)  (John-ga nani-o kaw-ana-i)-demo

This seems justified by the fact that *demo*-pronouns and *mo*-pronouns do not contrast. The forms

(92)  *dare-demo hon-o kaw-anakat-ta.
(93)  *John-ga nan-demo kaw-anakat-ta.

are not acceptable as actual speech forms. Thus the following rule can be introduced:

(94)  mo-Conversion
    demo → mo  in env. [dare ] -X- na- Aux
This will convert the basic forms (90) and (91) into the intermediate forms (88) and (89). But nouns in negative sentences may have either *demo* or *mo* attached.

(95)  
John-demo hon-o kaw-anakat-ta.

Even John did not buy books.

(96)  
John-mo hon-o kaw-anakat-ta.

Also John did not buy books.

6. The indeterminate pronouns seem to be related to the particle *mo* in the comparative construction as well as in negatives. This is interesting in that the comparative construction in English also requires *any*-words.

In discussing the comparative here we will restrict ourselves to those points directly related to the present topic.

(98)  
John-wa Bill-yori-mo rikoo-da.

*than* intelligent

John is more intelligent than Bill.

(99)  
John-wa Bill-ga kat-ta-yori-mo takusan hon-o kat-ta.

*buy* *than* many *book buy*

John bought more books than Bill did.

The comparative construction clearly involves a subordinate sentence, which may undergo various ellipses. Thus, (99) may be reduced to

(100)  
John-wa Bill-yori-mo takusan hon-o kat-ta.

Conversely (98) should probably be regarded as the obligatory ellipsis of

(101)  
John-wa Bill-ga rikoo-de ar-u-yori-mo rikoo-da.

John is more intelligent than Bill is intelligent.
Now, if John is not compared with Bill but with anyone, we have

(102)  John-wa dare-yori-mo rikoo-da.
John is more intelligent than anyone else.

(103)  John-wa dare-ga kat-ta-yori-mo takusan hon-o kat-ta.
John bought more books than anyone else did.

or

(104)  John-wa dare-yori-mo takusan hon-o kat-ta.
John bought more books than anyone else.

Sentence (103) provides another interesting example of an indeterminate pronoun without any implication of interrogation. But notice that the subordinate sentence is followed by mo after the conjunction yori, and one may suppose the basic form of the subordinate sentence to be:

(105)  (dare-ga hon-o takusan kat-ta)-mo
But mo after yori is generally redundant. Instead of (98) and (99) one may say, without changing the meaning:

(107)  John-wa Bill-ga kat-ta-yori takusan hon-o kat-ta.

Only when the subordinate sentence contains an indeterminate pronoun will the absence of mo result in unnatural forms:


From this deletability of mo and from the fact that in the case of negation we do not set up the underlying mo-sentences with an indeterminate pronoun, we interpret mo after yori as being of secondary origin, inserted by:

(110)  mo-Insertion
Ø  →  mo  in env. yori
This rule is generally optional, but obligatory when the subordinate sentence contains an indeterminate pronoun.

A psychological explanation of the introduction of the particle *mo* in comparative constructions may be given as follows. Sentence (99) may be paraphrased by the following two sentences:

(111) Bill-mo hon-o takusan kat-ta.
Bill, too, bought many books.

(112) (sikasi) John-wa motto takusan kat-ta.
(but) more many buy
(But) John bought more.

Or, better, the following sentence may occur before (111):

(113) John-wa hon-o takusan kat-ta.
John bought many books.

Of course, read strictly logically, (99) does not necessarily imply that Bill bought many books. But psychologically, and in the ordinary sense, the comparison of (99) generally would not be made if Bill did not buy many books.

7. The particle *ka* is also attachable to the indeterminate pronouns. The *ka* pronouns, *dare-ka*, *nani-ka*, etc., are equivalent to the English "some"-words like "someone," "something," etc.

(114) dare-ka-ga hon-o kat-ta.
Someone bought books.

(115) John-ga nani-ka-o kat-ta.
John bought something.

It might be supposed that the basic forms of these sentences are

(116) (dare-ga hon-o katta)-ka
and

(117)  (John-ga nani-o kat-ta)-ka

with ka then being attached to dare and nani, respectively. Recall, however, that ka is not attachable to an ordinary noun, so that we do not have

(118)  *John-ka-ga hon-o kat-ta.

supposed to be derived from

(119)  (John-ga hon-o kat-ta)-ka

Actually, disjunction by means of ka needs at least two component sentences. Thus, while (119) cannot be a basic form, the following can:

(120)  (John-ga hon-o kat-ta)-ka (Bill-ga hon-o kat-ta)-ka

(=45)

It will be assumed, then, that the basic form of (114) is:

(121)  (dare-ga hon-o kat-ta)-ka (dare-ga hon-o kat-ta)-ka

The second component sentence will be deleted to yield (116) as an intermediate form, and the actual speech form (114) will be obtained by attaching ka to dare. Note that (116) is not disjoined with itself necessarily as in (121): there may be basic forms like

(122)  (John-ga hon-o kat-ta)-ka (dare-ga hon-o kat-ta)-ka

which will yield


or, by the Shortening rule (47),


Another shortened form which might be expected from (123) by the Shortening rule (48) is
(125)  *John-ka dare-ga hon-o kat-ta.

But this is not well-formed. To exclude it we have only to assume that the attachment of ka to dare occurs before ka-
Deletion (46). Similarly, the basic form of (115) is assumed to be

(126)  (John-ga nani-o kat-ta)-ka (John-ga nani-o kat-ta)-ka

To assume the basic form (121) for (114) has an additional consequence in connection with the interrogative sentence corresponding to (114):

(127)  dare-ka-ga hon-o kat-ta-ka.

The explanation of the above sentence is parallel to that given in section 3 for the interrogative sentence:

(128)  John-ka Bill-ka-ga hon-o kat-ta-ka.  (= 64)

Did John or Bill buy books? ("yes-no" question)

If the basic form of (114) is (121), the basic form of (127) should be assumed to be:

(129)  ((dare-ga hon-o kat-ta)-ka (dare-ga hon-o kat-ta)-ka)

((dare-ga hon-o kat-ta)-ka (dare-ga hon-o kat-ta)-ka)-

Neg-ka Q

From this the negative 'll be deleted, just as in (128):

(130)  ((dare-ga hon-o kat-ta)-ka (dare-ga hon-o kat-ta)-ka)-

ka Q

Then the second component of the disjunction is deleted, as in (114):

(131)  (dare-ga hon-o kat-ta)-ka-ka Q

From this the speech form (127) is derived by attaching ka to dare.

The generative origin of the two occurrences of ka in (127)
should be noted and compared with the instances of *ka* in (128); the sentence-final *ka* and the *ka* after *dare* in (127) correspond generatively to the sentence-final *ka* and the *ka* after John in (128). It is clear that the interrogative form of (124):


will now be completely explained as parallel to (128).

Thus, "yes-no" questions containing *ka*-pronouns are, just like general "yes-no" questions, derived from disjunction of a special type that is, disjunction of a sentence and its negation. We know that the general type of disjunction yields non-"yes-no" questions. Thus, if

(133) (John-ga hon-o kat-ta)-ka (Bill-ga hon-o kat-ta)-ka

is put into the interrogative,

(134) (John-ga hon-o kat-ta)-ka (Bill-ga kat-ta)-ka Q

we will get the actual speech form:


Did John buy books or did Bill buy books?

Then the non-"yes-no" question:

(136) dare-ga hon-o kat-ta-ka.

Who bought books?

can reasonably be understood to be an analogue of (135) when (133) is replaced by (121); that is, the basic form of (136) is now assumed to be

(137) (dare-ga hon-o kat-ta)-ka (dare-ga hon-o kat-ta)-ka Q.

The second component of the disjunction is again deleted:

(138) (dare-ga hon-o kat-ta)-ka Q

It should be noted that *ka* will not be attached to *dare* in this
case. Thus, if a sentence ending with *ka* contains an indeterminate pronoun, *ka* is attached to the pronoun unless *ka* is directly followed by the question marker.

7. We will now assume we have justified calling *dare*, *nani*, etc., indeterminate pronouns rather than interrogative pronouns. It can be said that the role of the indeterminate pronouns are very much like that of yet unbounded logical variables. Attachment transformations will then be regarded as the process of binding those variables in some sense or other. However, the indeterminate pronouns appear to be generated only in sentences that end in either *demo* or *ka*. That is, the node Noun Phrase can dominate *dare* and *nani* only if either *demo* or *ka* is attached to the sentence. This mutual dependence of the indeterminate pronouns and the particles *demo* and *ka* is essentially not phrase-structural. It seems, then, that we have been led to an unsatisfactory situation.

At this point let us recall that part of English structure corresponding to the part of Japanese structure we are dealing with. English interrogative and relative pronouns *what*, *who*, *which*, as well as concessive pronouns like *whoever*, *whichever*, and *whatever* and other related forms, explained elegantly if we view them as resulting from the attachment of the WH-marker to the determinate and indeterminate determiners *that* and *some*. Briefly, and not too precisely, *which* and *what* are regarded as WH + *that* and WH + *something*, respectively. Now, if we want to generate the interrogative pronouns *which* and *what* directly in the phrase structure, they would be subject to the restriction
that they can appear only if the sentence is not headed by the WH marker. However, if these words are generated by attachment, the problem will not arise. The determinate and indeterminate pronouns *that* and *something* are not subject to the same kind of restriction; they can appear in both declarative or interrogative sentences.

In the case of Japanese, the word corresponding to *something*, "nani-ka," is derived from the word corresponding to *what*, "nani." Thus *nani* must be considered a more basic form than *nani-ka*, and it would seem that we are led to having to generate *nani* directly. The conclusion we shall come to, however, is that the indeterminate pronouns are themselves not primitive. They will be understood to be an amalgam of a nominal element PRO(noun) and the indeterminate marker IND. More precisely, PRO will be introduced within the phrase-structural scheme just as ordinary nouns are, and IND, which will be generated at the end of the sentence, will be attached to PRO to yield the indeterminate pronouns *dare, nani*, etc. Thus there will be some parallels with English.

To justify this interpretation, the nature of the nominal element PRO will have to be clarified, and this will be done in Chapter IV. Here, therefore, the description of indeterminate pronouns will be left incomplete, and we will return to it at the end of the next chapter.
FOOTNOTES

1 As will be shown in Chapter VI, *ga* and *o* cannot precisely be called subject and object markers, respectively, when sentence embedding is involved. But these terms can be used here for convenience without any danger of misinterpretation.

2 We assume that Sen is a different syntactic label from *S*, and that a disjoined sentence has the following structure:

\[(S\text{-}ka \ S\text{-}ka)_{\text{Sen}}\]

3 At this moment reference to \((\phantom{\text{Sen}})\) in (47) and (48) is not motivated. It will be shown later that this reference is meaningful.

4 Answers to (59) (or (60)) and (49) will take different forms. A "yes-no" answer such as

'Iya, kaw-anakat-ta.
No, (he) did not.'

will be given to (61) but not to (59) (or (60)). But this does not prevent us from setting up the same basic form for (49), (59), (60).
CHAPTER IV  Pronominalization

1. Traditionally English grammar recognizes a part of speech called pronoun. In the study of Japanese grammar, on the other hand, the pronoun has not enjoyed so secured a position. Some grammarians set up pronouns as a part of speech, while others do not. Thus, turning to two different modern Japanese grammarians, S. Hasimoto and M. Tokieda, we see that the latter recognizes pronoun as a part of speech, but not the former. Hasimoto maintains that distinguishing substantives as proper nouns, common nouns, pronouns, and numerals may be of some semantic interest but is not necessary in grammar since there is no formal difference corresponding to the semantic difference. (S. Hasimoto (1948) p. 66). Tokieda does not give any formal characterization either. His discussion is based solely on gross semantic considerations. (M. Tokieda (1950) p. 72) Thus, words called personal pronouns in Japanese are semantically identified, whether or not one views them as representing a part of speech. For practical purposes they can be roughly identified as words that translate English personal pronouns. Generally, however, more than one personal pronoun is allotted to one grammatical category. Thus in Kindaiti (1952), watasi, boku, and temae are all listed as first person pronouns, and anata, kimi, omae as second person
pronouns. We shall come back later to this problem of the multiplicity of the so-called personal pronouns in Japanese.

In English grammar, as opposed to Japanese, one can easily point out formal (i.e., syntactico-morphological) characteristics of the personal pronouns. If we review some of these formal characteristics we can see that there is nothing corresponding to them in the case of the Japanese so-called personal pronouns. First, in Indo-European languages in general, the personal pronoun generally has a characteristic declension. In English, in which ordinary nouns have lost this declension, only the personal pronouns still preserve it. Secondly, the personal pronouns are not modified by adjectives in the way ordinary nouns are. Thus, we have

(1) the short man
but not
(2) *short he

In Japanese the so-called personal pronouns exhibit no such obvious peculiarities. They can be modified by an adjective just like ordinary nouns. We have

(3) ciisa-i hito
(4) ciisa-i kare
small he

2. It appears, then, that personal pronouns are not syntactically characterizable in Japanese as they are in English. But are these properties really significant in characterizing the personal pronouns in English? Is there nothing in Japanese that deserves to be called personal pronoun? These questions seem
difficult to handle within the framework of the traditional or the taxonomic approach. The syntactic nature of the personal pronouns lies in the transformational structure of language and therefore could not really be clarified before the development of the generative grammar approach. We intend to show that an understanding of the transformational nature of English personal pronouns leads to the view that there is indeed one grammatical entity in Japanese that may well be called personal pronoun, but that it is different from any of those that have been called this previously.

Before going into the transformational analysis of the personal pronouns, it would be interesting to mention a taxonomic observation which reflects the transformational character of such pronouns. The personal pronouns "are repeatable as nouns (and most other pronouns) are not, so that though it is not usual to say

(5) George does George's work when George feels like doing George's work

it is quite normal to say

(6) He does his work when he feels like doing it." (Long, (1961) p. 50) (The example was slightly changed for convenience in giving the Japanese equivalent.) The sentence that would normally replace (5) is, of course,

(7) George does his work when he feels like doing it.

The Japanese form corresponding to (5) and (6) would be

(8) George-wa George-ga George-no sigoto-o si-ta-i-toki-ni work do-want-time

George-no sigoto-o su-ru.

work do
In the Japanese case, however, neither (8) nor (9) is usual. In other words, the so-called personal pronouns are not repeatable either. Furthermore, if we replace George in (8) by kare, just as we replace George by he in (5) to get the grammatical (7), the result is

(10) George-wa kare-ga kare-no sigoto-o si-ta-i-toki-ni kare-no sigoto-o su-ru.

which is, again, not usual. To get a normal sentence from (8), it is necessary to delete all the repeated George's and George-no sigoto:

(11) George-wa si-ta-i-toki-ni sigoto-o su-ru.

Similarly, to get a normal sentence from (9), the repeated kare's and kare-no sigoto are deleted:

(12) kare-wa si-ta-i-toki-ni sigoto-o su-ru.

We have therefore arrived at the taxonomic observation that in English the personal pronoun he and the noun George are shown by (6) and (7) to have different distribution, while in Japanese the so-called personal pronoun kare reveals no distributional peculiarity.

3. This observation will now be described in terms of generative grammar. Sentence (7) is derived from (5) by means of
pronominalization, which, according to Lees (1960), is formalized as follows:

\[(13) \quad \text{Pronominalization in English} \]
\[
X - N_1 - Y - N_2 - Z \rightarrow X - N_1 - Y - N_2 + \text{Pron} - Z
\]

where \( N_1 = N_2 \)

Here Pron is a marker, and the string \( N + \text{Pron} \) will be replaced by \( \text{he} \) etc., by morphophonemic rules. In Japanese, on the other hand, the grammatical form (11) is derived from (8) by deleting the repeated nouns. The transformation for Japanese corresponding to (13) may be formalized as:

\[(14) \quad \text{Pronominalization in Japanese} \]
\[
X - N_1 - Y - N_2 - Z \rightarrow X - N_1 - Y - Z
\]

where \( N_1 = N_2 \)

It can be claimed that (13) and (14) have the same syntactic role and therefore can both be called pronominalization, although in the Japanese case a "pronoun" does not appear in the actual speech form.

But now let us look at the English (6) and Japanese (12), in which the subject is a so-called personal pronoun. In the Japanese case, it is clear that (14) again applies to (9) to get (12). Thus, the so-called personal pronoun behaves in the same way as a noun with respect to Pronominalization (14).

What is implied here is the taxonomic observation made above, that in Japanese the so-called personal pronoun has the same distribution as the ordinary noun. To generate the English sentence (6), on the other hand, there does not at first seem to be any need to apply rule (13). However, "it is important not to confuse independently chosen nouns \( \underline{\text{he}}, \underline{\text{she}}, \underline{\text{it}}, \underline{\text{her}}, \) etc.,
which can also occur in kernel sentences along with John, Mary, table, etc., with the pro-nouns of the same shape which must be introduced transformationally in place of certain repeated nouns at this stage. In fact, we might even conceive that certain repeated nouns he, she, etc., are themselves vacuously replaced by the corresponding pro-nouns of the same shape, for otherwise unnecessary restrictions on these pronoun rules would have to be formulated, and also a false representation of grammatical structure of sentences would result from our derivations of sentences." (Lees (1960) p.100) According to this view the generation of the actual speech form (6) completely parallels that of (7), and the above-mentioned observation that the personal pronoun is repeatable while ordinary nouns are not would be reduced to an illusion caused by the phonological fact that the noun he and the pro-noun he happen to have the same phonetic shape.

Although the treatment of English pronominalization as formulated in rule (13) will, essentially, be followed, some formal clarification seems desirable. Indeed, the relation between the noun he and the pro-noun he is not sufficiently clear from the above explanation. In this regard it seems profitable to reinterpret the marker Pron in formula (13) as a feature specification. More precisely, let us introduce a syntactic feature Pro-ness¹ and assume that an ordinary noun is specified as nonPro in its complex symbol. Pronominalization is then reinterpreted as a rule of respecification of a feature. We may rewrite it in the form familiar in phonology:

(15)   Pronominalization
On the other hand each personal pronoun is represented in the dictionary by an entry including the specifications Noun and Pro, among others. This dictionary entry is assumed to possess no phonological matrix (or, more exactly, no specification is entered in the phonological part of the dictionary entry), for reasons that will be made clear below. Thus, the personal pronoun he will be represented by

(16) \[
\begin{array}{c}
+Pro \\
+Noun \\
+Human \\
+Singular \\
+ThirdPerson \\
+Masculine \\
\text{etc.} \\
\end{array}
\]

Compare this with the dictionary entry of an ordinary noun, say, George:

(17) \[
\begin{array}{c}
-Pro \\
+Noun \\
+Human \\
+Singular \\
+ThirdPerson \\
+Masculine \\
+ProperNoun \\
\text{etc.} \\
\text{/George/}
\end{array}
\]

Let us consider the two sentences (6) and (7). For convenience we will disregard pronominalization of the noun phrase his work and concentrate on the words George and he. We may then consider the following to be underlying forms of (6) and (7), respectively:

(18) He does his work when he feels like doing it.
(19) George does George's work when George feels like doing it.
In (18) he stands for the complex symbol (16), and in (19) George stands for (17). Pronominalization, as reinterpreted in (15), will apply vacuously to (18), while in (19) it will change the specification nonPro in the second and the third occurrences of George into Pro. The following complex symbol then will appear in these two positions:

$$
(20) \begin{array}{c}
+\text{Pro} \\
+\text{Noun} \\
+\text{Human} \\
+\text{Singular} \\
+\text{ThirdPerson} \\
+\text{Masculine} \\
+\text{ProProNoun}
\end{array}
/\text{George}/
$$

To get actual phonetic forms like (6) and (7), there is assumed to be a morphophonemic rule as follows:

$$
(21) \begin{array}{c}
+\text{Pro} \\
+\text{Singular} \\
+\text{ThirdPerson} \\
+\text{Masculine}
\end{array} \rightarrow /\text{he}/
$$

That is, when the complex symbol has the specifications listed on the left-hand side of the rule, the phonological part of that symbol will be replaced by the phonological matrix that appears the right-hand side of the rule. This rule applies uniformly to the complex symbols (16) and (20) contained, respectively, in (18) and in the form obtained from (19) by application of Pronominalization. Now let us use A and B to denote the complex symbols obtained from (16) and (20) by application of the morphophonemic rule (21):
Then the intermediate forms underlying (6) and (7) at this stage will be, respectively,

(24) A does A's work when A feels like doing it.
(25) George does B's work when B feels like doing it.

The complex symbols A and B are different, but their difference is not actually relevant: all the rules to be applied to (24) and (25) are morphophonemic or phonological rules which are assumed not to refer to any syntactic features differently specified in A and B, like ProperNounness, for example. A and B are eventually replaced by their identical phonological part /he/, which will result in the actual speech forms (6) and (7).

In the case of the first and second person pronouns there is no need for morphophonemic rules like (21) to be introduced. Accordingly it will be assumed that the dictionary entries representing these pronouns do include the phonological matrix. That is, the dictionary entry for the pronoun I will be
As far as our present problem is concerned, the form:

(27) I do my work when I feel like doing it.

itself can be taken as the basic form of the sentence (27), understanding that I represents the complex symbol (26). Pronominalization (15) applies on this string vacuously, just as it did on the basic form (18).

It now becomes clear that we do not have to conceive of two different entries noun he and pro-noun he, noun I or pro-noun I, etc., as done in earlier work in generative grammars, and the taxonomic observation cited above that "the personal pronouns are repeatable as nouns (and most other pronouns) are not" is, in a reasonable sense, supported. This new interpretation of the pronoun is, as we have seen, a result of recent developments in syntactic theory, bringing the notions of feature and of feature specification into syntax. For details see Chomsky (1965).

4. Let us now go back to Japanese and investigate the process (14) corresponding to English pronominalization and the nature of the so-called personal pronouns. The deletion process (14) applies indiscriminately to nouns and the so-called personal pronoun. Consequently the distributional difference observed in the case of English in (6) and (7) does not exist here, and in (12) the personal pronoun appears only in the
position corresponding to the independent use of the personal pronoun in the English sentence (6); i.e., the Japanese so-called personal pronoun corresponds only to the nominal instance, in Lees' sense, of the English pronoun. Thus, in connection with the process of pronominalization there is no reason to give special treatment to the so-called personal pronouns; they may be regarded simply as nouns.

It would seem, then, that Japanese differs from English with regard to the existence of personal pronouns. Nevertheless, the grammatical process of pronominalization in English is paralleled in Japanese by (14). Since (14) is a deletion rule, there is a distributional correspondence between the pronominal use of the pronouns in English and the zero in Japanese. Given our formulation of Pronominalization in English, it does not seem accidental that the independent and anaphoric uses of the pronoun appear in the same phonetic form. Indeed, one may suspect that human psychology generally demands the same form for the independent and anaphoric pronouns. This appears to be violated in Japanese, since the form kare seems to correspond to the independent use of he, and zero to the anaphoric use. But the fact is that zero can also be taken to correspond to independently chosen English pronouns since the following is well-formed:

(28) hon-o kat-ta.

book buy

X bought books.

This type of sentence can be used when the subject of the action is clear from the extra-linguistic or discourse context. The
subject can be first, second, or third person, singular or plural. The dependence of (28) on context may lead one to question its grammaticality, but it can be taken to be as well-formed as the English sentence

(29) He bought books,

where the referent of he is also dependent on the extra-linguistic or discourse context. The difference between zero in (28) and he in (29) is that the latter has a more restricted range of possible referents. In taxonomic terms, then, it can be said that zero in Japanese has structurally the same distribution as the set of all personal pronouns in English. To reflect this in a generative device, we need only introduce the syntactic feature Pro-ness in Japanese and take (15) rather than (14) as the Pronominalization rule in Japanese as well as in English. There will be one dictionary entry in Japanese corresponding to all the personal pronouns in English:

(30) \[
\begin{array}{c}
\text{[+Pro]} \\
\text{[+Noun]} \\
\text{[}\emptyset\text{]} \\
\end{array}
\]

Corresponding to the morphophonemic rule (21) will be the following:

(31) \([+\text{Pro}] \rightarrow \emptyset\)

The phonological matrix of a complex symbol which has the specification Pro is replaced by nothing at some stage in the phonological component. From here on, we will refer to the complex symbol with the specification Pro by PRO.
5. Up to this point we have been discussing pronominalization within the range of facts that formulation (13) in Lees (1960) was originally intended to cover. It can be shown, however, that in English this process can be understood in a broader perspective. On the one hand the rule of Pronominalization can be interpreted in a more general way; on the other hand, another special rule, Definitization, can be introduced to supplement Pronominalization as it operates in the more restricted sense we have been dealing with thus far. The more general interpretation of pronominalization appears to be highly significant in connection with the mechanism of relativization and interrogation in English. We shall give only a brief account here of the principles underlying this generalization. (For a more complete treatment, see Kuroda (unpublished a, b))

As a formulation of the syntactic process intended by Lees to be represented by (13), neither that rule nor rule (15), which was meant to be a revision of that rule, is strictly correct. Actually a repeated noun is to be replaced by a personal pronoun only if it has the same referent as its predecessor. Thus, as an extreme case, (5) is grammatical if all the instances of George are considered to refer to different persons with the same name. On the other hand, however, even when a repeated noun does not have the same referent as the antecedent noun, the repetition of the noun is still in general avoided. Usually there is either deletion or the use of the so-called indefinite pronoun one (ones).
(32) John prefers a hard pencil to a soft one.
(33) John prefers hard pencils to soft ones.
(34) John likes sour milk better than fresh.

These are the surface forms, respectively, of
(35) John prefers a hard pencil to a soft pencil.
(36) John prefers hard pencils to soft pencils.
(37) John likes sour milk better than fresh milk.

It should be noted that the substitution of indefinite pronouns for repeated nouns is not totally unconditioned. When George in the when-clause of (5) does not refer to the same George as in the main clause, it is not replaced by an indefinite pronoun. This unsubstitutability is not just a peculiarity of proper nouns, since it still holds if George is replaced in (5) by a common noun, say, boy. Explicit indication of the distinctness of referents by means of different modifiers apparently permits the substitution of the indefinite pronoun in many cases, as seen from the above examples and from the following slight variation of (5): 3

(38) The younger boy does his work when the older one feels like doing his.

Substitutability of the personal pronoun for a co-referential repeated noun is not totally unconditional, either. Thus, it is grammatical to say

(39) After having described the way that he would disappear, he then disappeared that way before our eyes.

and
(40) After having described the picture he would draw, he then drew that picture before our eyes. But the latter becomes more natural when **that picture** is replaced by the personal pronoun **it**, while substitution of **it** for **that way** in (39) will result in a totally ungrammatical form:

(41) *After having described the way he would disappear, he then disappeared **it** before our eyes.

(42) After having described the picture he would draw, he then drew **it** before our eyes.

The following remarks can be made on the basis of the above observations. First, in neither coreferential or noncoreferential cases is substitutability of the pronoun totally unconditional as a rule of the form (15) would imply. Secondly, putting aside the independent problem of specifying the conditions of substitutability, it is reasonable to assume that these two cases are not independent syntactically but rather involve one and the same process, which may be called Pronominalization. The difference is then ascribed to some additional syntactic process that co-occurs with Pronominalization in one case or in the other. Actually, as (39)-(42) suggest, the process of pronominalization by means of personal pronouns (i.e., the coreferential case) may properly be divided into two independent syntactic processes: one would derive (39) and (40) from their underlying forms, whatever these may be, by assigning the definite determiner **that** to the repeated noun
phrases \textit{way} and \textit{picture}, respectively; the other would be responsible for further deriving (42) from (40). The burden of processing the information for coreference is, then, turned over to the first process, which may be called Definiteization, and the second process, Pronominalization, which we formerly viewed as being involved in both coreferential and noncoreferential cases, will now work only on formal identities. Leaving aside certain details and technicalities, we may now formulate Definitization as follows:

(43) Definitization

\[ \text{X - N - Y - N - Z} \rightarrow \text{X - N - Y - DEF+ N - Z} \]

where the two N's on the left-hand side are coreferential.

(Here DEF is a marker which, when phonetically realized, is that in most cases.) Rule (15) will be reinterpreted as applying more generally, that is, without assuming coreference.

As a result of this revised interpretation of pronominalization, the morphophonemic rule, (21), will have to be subject to the contextual restriction 'after the marker DEF':

(44) \[
\begin{array}{c}
\text{[+Pro} \\
\text{[+Singular} \\
\text{[+ThirdPerson} \\
\text{[+Masculine]}
\end{array} \rightarrow /he/ \text{ in env. DEF }.
\]

In other environments, Pro will be phonetically realized as one (ones) or will be deleted:

(45) \[
\begin{array}{c}
\text{[+ Pro]} \rightarrow \{ /one(s)/ \text{ in some environment} \\
\text{\textit{\phi} in some others}
\end{array}
\]

Let us now again turn our attention to Japanese. Certain arguments having to do with semantics and universality may lead
one to suspect a parallel organization of the pronominalization process in Japanese. One may further suspect that in Definitization the word *sono* will play the role of *that* in English. We are not at present in a position to develop organized and meaningful syntactic argument about Definitization, which quite probably will have to be introduced in Japanese. However, it does seem fairly clear that Pronominalization should be understood in the broader sense, that is, to cover the non-coreferential case as well as the coreferential. The use of the word *no* as the so-called formal noun (*keisikata-mei*su) can safely be taken as a typical example of non-coreferential pronominalization. Thus the English examples (32) - (34) can be rendered into Japanese as

(46) John-wa yawaraka-i enpicu-yori-mo kata-i-no-o kono-u.

soft pencil-than hard-one like

John likes hard pencils better than soft ones.

(47) John-wa sinsen-na gyuunyuu-yori-mo suppai-no-o konom-u.

fresh milk-than sour-one like

John likes sour milk better than fresh.

It should be noted that the Japanese sentences do not become less natural when the nouns are repeated. It is quite all right to say:

(48) John-wa yawaraka-i enpicu-yori-mo kata-i enpicu-o konom-u.

The discussion here will remain informal, and no statement will be made that *no* is a phonetic form of the pronoun in the exact sense, that is, we are not proposing any morphophonemic
rule like:

\[(49) \ [+\text{Pro}] \rightarrow \text{no} \quad \text{in some environments}\]

Rather, no in this instance can probably be explained as one case of a more general morphophonemic process that inserts no as an empty carrier of a modifying clause when the noun to be modified is removed from its ordinary position.

\[(50) \ \text{ringo-no aka-i-no-o tabe-ru}\]
\[\text{apple red eat}\]
The above form has an inverted order and is clearly related to the normal form:

\[(51) \ \text{aka-i ringo-o tabe-ru}\]
\[\text{red apple eat}\]

Whatever syntactic and semantic processes are involved here, it seems fair to assume that no is inserted automatically after the removal of the noun from its original position. Thus, in the noncoreferential as well as the coreferential case the phonetic realization of Pro can be taken as zero.

We will not introduce a Definitization Rule here explicitly, but we will understand that the same rule (15), Pronominalization, will apply directly either coreferentially or noncoreferentially, whenever the condition of pronominalization is satisfied.

6. The syntactic mechanism of pronominalization in the two languages has now been clarified. It can be said that in a deeper part of the syntax, pronominalization has the same structure in the two languages, as embodied in the same rule, (15). The differences seem to lie in the fact that there are
several personal pronouns in English but only one in Japanese, and while those in English are always realized by phonetic entities the single one in Japanese is never phonetically realized.

These differences are, in reality, less surprising than they may seem at first. The fact that English has several different personal pronouns can be regarded as a natural consequence of something quite independent of the process of pronominalization itself, that is, the presence of the syntactic features of person, number, and gender. Different combinations of these features with the specification Pro are responsible for producing the different forms of the personal pronouns. The uniqueness of the pronoun in Japanese will then be simply a consequence of the fact that Japanese does not possess (and never has possessed) those features as syntactic features.

The fact of the unique personal pronoun being phonetically realized as zero is not peculiar only to Japanese. Even in English, as soon as the pronoun is relieved of the syntactic features of person and number (and the marker DEFiniteness), it tends to disappear. In examples (32) and (33), grammatical number is carried by the forms one and ones, but in (34), since mass nouns are not marked for number, there is nothing to be carried by the pronoun and it simply disappears.

As already mentioned, those Japanese nouns which are generally called personal pronouns (watasi, "I," kimi, "you," kare, "he," etc.) are not considered here to be personal pronouns. More precisely, these nouns are assumed to be specified
as nonPro. If we can talk about universal semantic features, perhaps we must say that they have the same semantic features as the English personal pronouns and from this point of view should also be called by that name. The important point is not their name however, but their syntactic nature. The fact that there is more than one so-called personal pronoun for the same grammatical person is probably related to their nominal character. Thus, watakusi, (watasi), ore, temae, boku, sessya, zibun, and perhaps some others, are listed as first person pronouns in Kindaï (1952), and anata, kimi, omae, temae as second person pronouns. Each of these has a particular connotation for the speaker and listener. Choosing one of them is much like choosing an appropriate ordinary noun to denote some entity. Specialization in meaning in the so-called personal pronouns is certainly incompatible with the highly syntactic nature of the anaphoric use of the real personal pronoun. Indeed it suggests that these items are, instead, members of a major category, i.e., noun.

The comparison made here between the two languages, either by implication (e.g., using the same name for certain transformations in both languages) or by explicit statements, are motivated solely by formalism in the rules. It is quite another problem to compare the languages on the level of language behavior based on those rules. Thus, when it is said that the single personal pronoun in Japanese, which phonetically appears as zero, corresponds to the whole class of the English personal pronouns, it by no means implies that, given an English
sentence either in isolation or in some context, replacing every English personal pronoun with zero in the corresponding Japanese sentence necessarily results in the equivalent natural Japanese sentence. Varying degrees of ungrammaticality, ranging from total unacceptability to near grammaticality, can be expected to result from such automatic replacement. In the first place, the contextual conditions which might be imposed on Definitization and Pronominalization can differ in the two languages. Secondly, other rules may affect the applicability of these two rules in each of the languages. As will be seen in the next chapter, definitization in Japanese involves different conditions than in English, so that the extent of application of Pronominalization immediately fails to match in both languages. These two factors contribute to the discrepancies between the languages, about which more and more will be said as the syntactic description of the two languages progresses. There is a third factor, too, and that is the different habits involved in the utilization of structurally corresponding rules in actual language behavior. This is, in principle, out of the realm of the generative grammar of each language. For example, in the situation in which the following English sentences would be uttered,

(52) There is a book there. I bought it yesterday.

it would not be usual to say in Japanese

(53) asoko-ni hon-ga ar-u. watasi-ga kinoo kat-ta.

there book be I yesterday buy

Instead one would say
We will now return to the indeterminate pronouns.

At the end of the preceding chapter it was noted that, while in English _wh_-words are considered to be derived from _some_-words, in Japanese the indeterminate pronouns _dare, nani_, etc., cannot be derived from the _ka_-pronouns, _dare-ka, nani-ka_, etc.

However, to consider the indeterminate pronouns as primitive elements would lead us to admit that they are subjected to an unfavorable nonphrase-structural restriction.

Once it is recognized that Japanese possesses the pronoun PRO, which is realized as zero on the phonetic level, it can then be presumed that the indeterminate pronouns are really an
amalgam of PRO and something attached to it. It is certainly reasonable from a semantic viewpoint to suppose that the indeterminate pronouns can be marked Pro. PRO can be generated freely by the phrase-structural scheme, and the nonphrase-structural restriction can be handled by the nonphrase-structural mechanism of attachment.

Following this line of thinking, one might take the sentence

(57) dare-demo hon-o kat-ta.

Everyone bought books to have the basic form

(58) PRO-ga hon-o kat-ta-demo

and say that attaching demo to PRO yields (57), introducing a morphophonemic rule to convert the string PRO-demo into dare-demo.

However, the indeterminate pronouns can sometimes appear without demo or ka attached. This suggests that attachment occurs twice. That is, to get dare-demo from PRO, for example, there would be one step to produce the form dare and then a second step to produce the form dare-demo. We will therefore introduce the marker INDeterminate and assume that ka and demo are introduced phrase-structurally accompanied by this marker. The marker can be interpreted as symbolizing the common syntactic characteristics of the two particles demo and ka. The basic form of (57) is now assumed to be

(59) PRO-ga hon-o kat-ta-demo-IND

First IND is attached to PRO to yield

(60) PRO-IND-ga hon-o kat-ta-demo

Then demo is attached as usual to yield (57). When (59) is used as a concessive subordinate clause, demo is not attached
Let us now turn to the following sentences:

(62) dare-ka-ga hon-o kat-ta.  (=III.114)
Someone bought books.
(63) dare-ga hon-o kat-ta-ka.  (=III.136)
Who bought books?

The basic forms of these sentences are assumed to be

(64) (PRO-ga hon-o kat-ta)-ka-IND (PRO-ga hon-o kat-ta)-ka-IND

(65) (PRO-ga hon-o kat-ta)-ka-IND (PRO-ga hon-o kat-ta)-ka-IND Q

The second component of disjunction is deleted from (64) and (65), as described in the preceding chapter:

(66) PRO-ga hon-o kat-ta-ka-IND

and

(67) PRO-ga hon-o kat-ta-ka-IND Q

IND is then attached to PRO:

(68) dare-ga hon-o kat-ta-ka
(69) dare-ga hon-o kat-ta-ka Q

These represent intermediate stages proposed in the preceding chapter, and the generative process proceeds as described there.

The introduction of the marker IND is not motivated just phonologically. Semantic significance can be given to IND-attachment, just as it was to the other attachment transformations. In some cases IND-Attachment is optional, and when
PRO does not have IND attached, it will be interpreted simply as PRO, that is, the pronoun phonetically realized as zero. For example, by not attaching IND to PRO in (59) and (67), we get, respectively:

(70) hon-o kai-demo si-ta. (or hon-demo kat-ta.)

PRO bought books or some other thing happened.

(or PRO bought even books or books or some other thing.)

(71) hon-o kat-ta-ka.

Did PRO buy books?

It must somehow be stated, however, that IND in (66) obligatorily attached to PRO, since there is no

(72) *PRO-ka ga hon-o kat-ta

The semantic significance of IND-Attachment is very much like that of WH-Attachment in English as explained in Chapter I.

To account for such comparative forms as

(73) John-ga dare-yori-mo rikoo-da.

John is more intelligent than anyone.

we will now assume that not only mo but IND is inserted after the comparative marker yori. The basic form of (73):

(74) John-ga #(PRO-ga rikoo-da)#yori-rikoo-da

will first be changed into:


The string rikoo-da in parentheses will be deleted and IND will be attached to PRO, yielding the actual speech form (73).

It should be pointed out that IND-Attachment is applied before Pronominalization. Consider the following sentence:
(76) John-wa hon-o kat-ta-toki kane-o harat-ta-ka.
Did John pay when he bought the books?
with the basic form: 5

(77) (John-wa (John-ga hon-o kat-ta-toki) kane-o harat-ta)-kawa-IND

The second component of the disjunction will be deleted as usual, giving:

(78) John-wa (John-ga hon-o kat-ta-toki) kane-o harat-ta-ka-IND Q

If Pronominalization were now to apply to this string, the result would be:

(79) John-wa (PRO-ga hon-o kat-ta-toki) kane-o harat-ta-ka-IND Q

If IND-Attachment attached IND to PRO in this form, we would get:

(80) John-wa dare-ga hon-o kat-ta toki kane-o harat-ta-ka.

As an actual speech form, this means:

(81) John paid when who bought the books?

Obviously, then, (80) cannot be assumed to be generatively derived from the basic form (77). This situation can be avoided simply by stipulating that IND-Attachment must apply before Pronominalization. In other words, IND is attachable only to the independently chosen, not the anaphorically introduced PRO.

The basic form of sentence (80) is:

(82) (John-wa (PRO-ga hon-o kat-ta-toki) kane-o harat-ta)-kawa-IND

(John-wa (PRO-ga hon-o kat-ta-toki) kane-o harawanakat-ta)-ka-IND Q
In the foregoing explanation of the generation of indeterminate pronouns (and ka-pronouns, etc.), the Human form dare (and dare-ka etc.) was used. The nonHuman form nani (and nani-ka etc.), is assumed to be generated in the same way, resulting from IND-Attachment to PRO. Obviously, though, dare and nani must be generatively differentiated in some way. This can be accomplished fairly easily by introducing the feature Humanness. This feature is needed anyway in Japanese to exclude such anomalous forms as

(83) *zassi-ga hon-o kat-ta.

Journals bought books.

Thus, if the specification Human is assigned to PRO, then PRO-IND will be supposed to be phonetically realized as dare, while if the specification nonHuman is assigned to PRO, the phonetic form nani will result.

The feature Humanness does not result in any need for two pronouns (dictionary entries), one PRO-Human and one PRO-non-Human. Let us assume that

(84) A-ga B-o C-\(\text{t}\)-\(\text{a}\).

is the base form, in the sense of Chomsky (1965), of the sentence

(85) John-ga hon-o kat-ta.

John bought books.

A, B, and C are appropriate complex symbols. The complex symbol A is specified as Human and C as HumanSubject. When PRO is inserted in A, it will inherit the specification Human.

Thus with the basic form
we get

(87)  dare-ga hon-o kat-ta-ka.

but not

(88)  *nani-ga hon-o kat-ta-ka.

What bought books?

On the other hand, B is probably specified as nonHuman, so that we can have:

(89)  John-ga nani-o kat-ta-ka.

What did John buy?

but not:

(90)  *John-ga dare-o kat-ta-ka.

Whom did John buy?

Some verbs can take either Human or nonHuman subjects. Thus, the verb taoree ("fall"), for example, can be inserted in the base form

(91)  D-ga E-ta.

where either D is Human and E is HumanSubject or D is nonHuman and E is nonHumanSubject. In the former case we can get:

(92)  dare-ga taore-ta-ka.

Who fell?

and in the latter case:

(93)  nani-ga taore-ta-ka.

What fell?

The form below, in which IND-Attachment has not taken place,

(94)  taore-ta-ka?

Did PRO fall?
is correctly regarded ambiguous with respect to Humanness of
the subject when compared with

(95) hon-o kat-ta-ka.

Did PRO buy books?

which is invariably understood to have a Human subject.
1 We will establish the following convention for denoting features and feature specifications. A feature is referred to by a noun with the suffix -ness. The form without -ness is used to denote the plus specification of that feature, and the minus specification is denoted by adding the prefix non. For example, man is specified as Human, meaning that man is specified as plus for the feature Humanness; dog is specified nonHuman, meaning that dog is specified minus for the feature Humanness.

2 Actually some of the specifications in (16) and (17) may be redundantly derived from others, so that they may be left blank in the dictionary. Further some features, in particular Singularenness, are not really considered inherent features of the noun, and the actual feature specifications will be introduced after the noun is inserted in the sentence by lexical rules. Obvious simplification of this sort in the theory will be ignored for simplification of exposition.

3 But this does not seem to be a necessary condition for substitutability; in fact while one can say

   John saw a policeman, and Bill saw one too.

the reaction of informants to the form

   A policeman saw John and one saw Bill too.

ranged from rejection through acceptance. Probably the form
A policeman was seen by John, and one was seen by Bill too.

is located between the first two with regard to its grammaticality. On the other hand, all of the following are quite all right:

John saw a tall policeman, and Bill saw a short one.
A tall policeman saw John, and a short one saw Bill.
A tall policeman was seen by John, and a short one by Bill.

The ill-formedness of (72), seems to be related, on the one hand, to the ill-formedness, say, of the form:


Did John buy books or did John buy books?

and, on the other hand, to the ill-formedness of a class of forms in which particles lose their carrier when PRO is deleted, like:

John-to PRO-ga hon-o kat-ta.
John and PRO bought books.

which, if PRO were regularly replaced by zero, would be represented by:

*John-to ga hon-o kat-ta.

The mechanism for filtering out these types of ill-formedness will not be specified here.

In this discussion we shall ignore the wa-Attachment transformation and assume that wa already appears in the initial phrase John-wa. Actually it occurs at the end of the sentence and is then attached to John.
Chapter V. REFLEXIVIZATION.

1. It is well known in English that the process of pronominalization, as formulated in Definitization (IV-43), Pronominalization (IV-15), and morphophonemic rules (IV-21), does not appear to work within a simple sentence. Thus, in the actual speech form derived from the underlying form

(1) John saw John.

the second John will be replaced, not by the personal pronoun he, but by the so-called reflexive pronoun himself:

(2) John saw himself.

To account for this apparent exception to Pronominalization, the following rule, Reflexivization, is introduced:

(3) Noun X Noun → Noun X Noun+Refl

Pronominalization can still be assumed to apply on this string after Reflexivization. Some morphophonemic adjustment will have to be made, of course, to account for forms like myself instead of meself, etc.

Turning to Japanese, similar apparent exceptions to Pronominalization can immediately be noted. Thus, the actual speech form
(4) John-ga mi-ta.
John saw PRO.

may mean

(5) John saw it.
or

(6) John saw him.
or

(7) John saw someone.

but it is not natural to interpret (4) to mean (2). That is, (4) is the speech form derived by Pronominalization from the basic form

(8) John-ga PRO-o mi-ta.

but not from

(9) John-ga John-o mi-ta.

To express the idea of (2), one may say either


John saw John-self.


John saw himself.

(12) John-ga zibun-o mi-ta.

John saw himself.

Hence the following ordered set of rules could be proposed to correspond to English Reflexivization:

(13) Noun X Noun → Noun X Noun+zin

(14) Noun+zin → zibun-zisin (optional)

(15) zisin → o (optional)
We will continue our discussion assuming these rules even though we shall eventually abandon them.

The essential character of English Reflexivization lies in the restriction of its application to the simple sentence. Thus, in the underlying form:

(16) John made Bill see John.

Reflexivization does not apply to the second John since it is not within the same simple sentence as the first John; (16) will undergo only Pronominalization, resulting in the actual speech form:

(17) John made Bill see him.

On the other hand, in the basic form:

(18) John made Bill see Bill.

Bill is the subject and the object of the verb see, so that Reflexivization applies within the same simple sentence to give the actual speech form:

(19) John made Bill see himself.

At this point we can see that Reflexivization in Japanese does not exactly parallel the English counterpart. From the basic causative form:

(20) John-ga Bill-o (Bill-ga John-o mi) Comp sase-ta.

John made Bill (Bill saw John) Comp.

we will get, by Reflexivization applied on John:

(21) John-ga Bill-ni zibun(-zisin)-o mi-sase-ta.

John made Bill see him.
On the other hand, from the basic form:

(22) John-ga Bill-o (Bill-ga Bill-o mi) sase-ta.

John made Bill (Bill saw Bill).

we will get, by Reflexivization applied inside the complement, the same speech form as (21):

(23) John-ga Bill-ni zibun(-zisin)-o mi-sase-ta.

John made Bill see himself.

Thus, as actual speech forms, (21) and (23) are ambiguous.³ This ambiguity results from the fact that Reflexivization may be applied beyond the boundary of the simple sentence. It will be our task, then, to try to find the conditions which limit the applicability of Reflexivization.

It should be noted for completeness' sake that the form to be expected from (20) and (22) by application of Pronominalization instead of reflexivization, namely


see-make

John made Bill see PRO.

cannot be taken as the actual speech form representing either (20) or (22): Reflexivization is therefore obligatory for both forms.

2. We will begin our examination by noting that if Reflexivization were unrestricted in its applicability, the process of pronominalization, in the coreferential case, would be reduced simply to a limited optional variant of Reflexivization. The fact that it is not so seems trivial, but there is some merit
in posing this problem explicitly.

Let us return to example (IV-11) in the preceding chapter:

(25) George-wa si-tai toki-ni sigoto-o suru.
    do-want time work do
George does his work when he feels like doing it.

The subject George in the time adverbial clause

(26) George-ga sigoto-o si-tai toki-ni, ...
    work do-want time
When George feels like doing his work, ...

is pronominalized and hence deleted in the actual speech form (25). If the tentative reflexivization rules (13) - (15) apply to George in (26), the following forms result:

(27) George-wa George-zisin-ga si-tai toki-ni sigoto-o suru.
    George does his work when George-self feels like doing it.

(28) George-wa zibun-zisin-ga si-tai toki-ni sigoto-o suru.
    George does his work when he himself feels like doing it.

(29) George-wa zibun-ga sitai toki-ni sigoto-o suru.
    George does his work when he feels like doing it.

All of these forms are grammatical. Before discussing their meaning let consider the following:

(30) John-wa Bill-ga mi-ta toki hon-o yon-de i-ta.
    see time book read be
John was reading a book when Bill saw him.

The underlying form of the time adverbial clause in this sentence is
(31) Bill-ga John-o mi-ta toki, ...

When Bill saw John, ...

and John in (31) is Pronominalized and hence deleted in (30). Application of the tentative reflexivization rules to John yields the following three forms:


John was reading a book when Bill saw John-self.

(33) John-wa Bill-ga zibun-zisin-o mi-ta toki hon-o yon-de i-ta.

John was reading a book when Bill saw himself.

(34) John-wa Bill-ga zibun-o mi-ta toki hon-o yon-de i-ta.

John was reading a book when Bill saw himself.

The forms (33) and (34) are grammatical but as indicated in the English translation, do not have the same meaning nor the same underlying form as (30). The underlying forms for (33) and (34) should be:

(35) John-wa Bill-ga Bill-o mi-ta toki hon-o yon-de i-ta.

John was reading a book when Bill saw Bill.

Form (32) should probably be taken to be grammatical also, and clearly involves some emphatic implication, as conveyed by the pseudo-English translation.

Returning to sentences (27) – (29), it can be observed that (28) and (29) involve the same emphatic implication as (32). Thus, it may reasonably be assumed that the basic forms for (27), (28), and (32) contain the emphatic marker, attached to George
in the first two cases and to John in the last one. In other words, the basic forms of (27) and (28) are assumed to be different from that of (25) and the basic form of (32) different from that of (30). In the case of (29) the emphatic implication is not obvious.

The reasonable conclusion seems to be the following. The form zibun is taken to be a token of the reflexive marker, while the form zisin is taken to be a token of the emphatic or distinguishing marker. Thus, zisin is to be introduced from the beginning in the basic forms, while zibun will be introduced transformationally. Accordingly, we will now abandon rules (13) - (15) and introduce the following rule:

(36) Reflexivization

Noun X Noun → Noun X zibun

The question posed at the beginning of this section now seems to be answered: Reflexivization does not apply to the object of time adverbial clauses.

This statement seems challenged when it is recognized that zibun in (33) and (34) could be interpreted as referring to John, the subject of the main sentence. Forms (33) and (34) are repeated below, with this suggested interpretation reflected in the English translation:

(37) John-wa Bill-ga zibun-zisin-o mi-ta toki hon-o yon-de i-ta.

John was reading a book when Bill saw John himself.

(38) John-wa Bill-ga zibun-o mi-ta toki hon-o yon-de i-ta.

John was reading a book when Bill saw him (=John).
However, we will claim that zibun in this reading is not to be regarded as the result of Reflexivization. The problem is somewhat specialized, but we will discuss it briefly.¹

A sentence is usually understood to express a speaker's assertion. When someone says

(39) John saw Bill.

or

(40) John was sad.

it is understood that he is asserting the fact represented by (39) or (40). Sometimes, however, a sentence is to be understood simply as a narration of a fact, without any implication of assertion. For example, in novels sentence (39) or (40) does not necessarily mean that the author is asserting the fact represented by the sentence. This distinction generally remains simply semantic, but in Japanese it becomes relevant in certain special cases, and some forms are permissible only in usual speech or in the narrative style.

Let us look at the set of adjectives which are paired with the verb form with the suffix garu; e.g., sabisii:sabisi-garu ("sad"). These adjectives with a non-first person subject are likely to sound somewhat unnatural in ordinary speech; but in narration they may be used freely with any type of subject.² Furthermore, let us consider sentences to which the sentence-final particle yo is attached. This particle seems to serve to identify sentences as assertions of the speaker. Thus it is not natural to say:

(41) *John-wa kanasikat-ta-yo.

sad
John was sad.
or

(42)  *John-wa samukat-ta-yo.

   cold

   John was (felt) cold.

We may say, on the other hand:

(43)  John-wa sabisi-gat-ta-yo.

   sad

   John was sad.

(44)  John-wa samu-gat-ta-yo.

   John   cold

   John was (felt) cold.

Returning to examples (37) and (38), it can be seen that the attachment of yo will preclude the reading of these sentences as below:

(45)  John-wa Bill-ga zibun-(zisin-)o mi-ta toki hon-o yon-de i-ta-yo.

   *John was reading a book when Bill saw him.

The translation of (45) should instead be that given in (33).

Thus, the reading given in (37) and (38) belongs to the narrative style, and this particular use of zibun can be excluded from our discussion of Reflexivization.

3. We have observed that when the object of the constituent sentence is coreferential with the subject of the matrix sentence, there are two possibilities: either it is Reflexivized as in the causative sentence (21) or Pronominalized as in the time adverbial clause in (30). The next question, then, has to do with the conditions of Reflexivization and Pronominalization.
The subordinate sentence of (30) is a time adverbial. We can observe that more generally the object of a subordinate clause which is coreferential with the matrix subject will be Pronominalized rather than Reflexivized. Thus, from the basic form:

      see be interval work do

John does his work while Bill watches John.

we will get:

(47)  John-wa Bill-ga mi-te iru aida-wa sigoto-o su-ru.
      John does his work while Bill watches him.

but not:

(48)  John-wa Bill-ga zibun-o mi-te iru aida-wa sigoto-o suru.
      John works while Bill watches himself.

Similarly we have, by Pronominalization:

(49)  John-wa Bill-ga yob-eba kotae-ta.
      call-if reply

John replied if Bill called him.

      call-even reply-not

Even if Bill called him, John did not reply.

      call though reply-not

John did not reply though Bill called him.

If the deleted PRO in the above sentences is replaced by zibun, semantically rather anomalous sentences result:

(52)  John-wa Bill-ga zigun-o yob-eba kotae-ta.

John replied if Bill called himself.
John did not reply even if Bill called himself.

John did not reply though Bill called himself.

Now compare the following sentences, which have place adverbial clauses:

(55) John is standing today at the place where Bill saw him yesterday.

(56) John is standing today at the place where Bill saw himself yesterday.

The constituent sentence of (20) is dominated by the node Comp, and Comp is in turn dominated by Verb. More typical complement constructions are those in which Comp takes the form of the object of the matrix sentence. In this case, too, the object of a complement coreferential with the matrix subject will be Reflexivized as in (20) rather than Pronominalized. Thus:

(57) John stopped seeing himself.

(58) John prohibited Bill from seeing him.
    persuasion-do-will-that think he
John thinks that Bill will persuade him.

(60) John-wa Bill-ga zibun-o miru koto-o kitai-si-te iru.
    see that act-do be
John expects that Bill will see him.

These forms, with the exception of (57), are in principle ambiguous; for example, (58) can also mean:

(61) John prohibited Bill from seeing himself.

On the other hand if zibun is replaced by PRO, i.e., by zero, the natural interpretation assumes some person or thing other than John as the object of the constituent sentence. This means that Reflexivization, but not Pronominalization, is applied on the constituent object of the basic forms of (57) - (60).

The next examples are particularly interesting in that the objects of the same sentence forms are Pronominalized or Reflexivized according to whether they are in an adverbial clause, as in (62) and (63), or the matrix object, as in (64) and (65):

(62) John-wa Bill-ga kakumat-tenai ie-de kurasi-te iru.
    Shelter house live be
John is living in the house in which Bill sheltered him.

    see day ill
John was ill when Bill saw him.

(64) John-wa Bill-ga zibun-o kakumat-tenai ie-o mi-te iru.
    shelter house see be
John is looking at the house in which Bill sheltered him.
John remembers the day when Bill saw him.

In examples (62) - (65) the constituent clauses are introduced by relativization, and the modified nouns are in an adverbial phrase in the constituent sentences:

(66) Bill-ga sono ie-ni John-o kakumat-ta.
that house shelter
Bill sheltered John in that house.

(67) Bill-ga sono hi-no John-o mi-ta.
that day see
Bill saw John on that day.

Let us now consider cases of relativization in which the modified noun is the object in the constituent sentences. Thus, let us relativize (66) and (67) with respect to Bill with the matrix sentences:

(68) John-wa Bill-o uragit-ta.
John betrayed Bill.

(69) John-wa Bill-o syooni-ni tanon-da.
    witness ask
John asked Bill to be a witness.

Insertion of (66) and (67) into (68) and (69), respectively, will yield the forms:

that house shelter betray-past
John betrayed Bill, who sheltered John in that house.
John asked Bill, who had seen John that day, to be a witness.

Then John in the constituent sentences will be Reflexivized, giving the forms:

(72) John-wa sono ie-ni zibun-o kakumat-ta Bill-o uragit-ta.
John betrayed Bill, who sheltered him in that house.

John asked Bill, who saw him on that day, to be a witness.

If, instead, we Pronominalized John in (70) and (71), we would get:

(74) John-wa sono-ie-ni kakumat-ta Bill-o uragit-ta.
John betrayed Bill whom he sheltered in that house.

(75) John-wa sono hi-ni mi-ta Bill-o syoonin-ni tanon-da.
John asked Bill, whom he had seen on that day, to be a witness.

However these forms, as the English translations suggest, are most naturally construed to be derived from the following basic forms by Pronominalization:

that house shelter betray
John betrayed Bill, whom John sheltered in that house.

that day see witness ask
John asked Bill, whom John had seen on that day, to be a witness.

Thus, again, Reflexivization, but no Pronominalization, is applied on the object of the constituent sentence in (70) and in (71).

To conclude, when the object of the constituent sentence is coreferential with the matrix subject, that object is Reflexivized if it is in the object or complement of the matrix verb, and Pronominalized if it is in an adverbial clause. Since the adverbial clauses are here assumed to be outside the node VerbPhrase, this may be restated in the following way: when the object of the constituent sentence is coreferential with the matrix subject, it is Reflexivized if it is dominated by the node VerbPhrase of the matrix sentence, and Pronominalized otherwise.

4. The preceding section dealt with the case of coreference between the matrix subject and the constituent object. Let us now turn to other possible combinations.

Examples of coreference between the matrix subject and the constituent subject have already been encountered. In Section 2 it was noted that from the basic form

(78) George-wa George-ga si-tai toki-ni sigoto-o suru.

\text{do\text{-}want \ time \ work \ do}

George does his work when George feels like doing it.

is derived the actual speech form

(79) George-wa zibun-ga si-tai toki-ni sigoto-o suru.

George does his work when he feels like doing it.
In the preceding chapter the form

\[(80) \quad \text{George-wa si-tai toki-ni sigoto-o suru.} \]

George does his work when he feels like doing it.

was also taken to be an actual speech form of (78). Thus, either Reflexivization or Pronominalization is applicable to the constituent subject George in (78).

Sentences (74) and (75) in the preceding section were considered to be derived from (76) and (77), respectively, by the application of Pronominalization to the constituent subject. Here, again, Reflexivization is also applicable and we may have

\[(81) \quad \text{John-wa zibun-ga sono ie-ni kakumat-ta Bill-o uragit-ta.} \]

John betrayed Bill, whom he sheltered in that house.

\[(82) \quad \text{John-wa zibun-ga sono hi-ni mi-ta Bill-o syoonin-ni tanon-da.} \]

John asked Bill, whom he had seen on that day, to be a witness.

It may now be stated as a principle that when the constituent subject is coreferential with the matrix subject, it may either be Reflexivized or Pronominalized.

In all other combinations of coreference, the second occurrence is generally Pronominalizable but not Reflexivizable. This may seem rather trivial, since it is semantically clear that Reflexivization always refers back to the main subject. But for the sake of completeness several examples will be given.

First, the matrix object may be coreferential with the constituent subject or object. We may have the following basic forms:
John introduced Bill to Tom when Bill came to Boston.

John appointed Bill an executive since Tom recommended Bill.

Repetition of the noun does not sound too awkward in these sentences, and they can be used as actual speech forms. But pronominalization is certainly possible:

John introduced Bill to Tom when he came to Boston.

John appointed Bill an executive since Tom recommended him.

Reflexivization, however, cannot apply to (83) and (84); if the matrix object Bill were replaced by zibun, zibun would have to be taken as referring to the matrix subject, thus resulting in the semantically more or less anomalous sentences:

John introduced himself to Tom when Bill came to Boston.

John appointed himself executive since Tom recommended Bill.

Pronominalizability of the object, however, seems to be subject to an additional constraint which is not clear-cut. For example,
when the matrix predicate is too short, Pronominalization of the object seems to be prevented. One would not derive from

\[ (89) \text{John-wa Bill-ga Boston-ni ki-ta toki Bill-o mi-ta.} \]

\[ \text{come time see} \]

John saw Bill when Bill came to Boston.
The Pronominalized form

\[ (90) \text{John-wa Bill-ga Boston-ni ki-ta toki mita} \]

\[ \text{come time see} \]

When Bill came to Boston, John saw him.

But one would probably say

\[ (91) \text{John-wa Bill-ga Boston-ni ki-ta toki MIT-no Kresge-koodoo-de mita.} \]

\[ \text{come time auditorium see} \]

When Bill came to Boston, John saw him at the Kresge Auditorium of MIT.

In any case, the matrix object cannot be Reflexivized when it refers back to the constituent subject or object.

In the basic forms (83) and (84), the order of the constituents of the matrix sentence can be so changed that the matrix object precedes the constituent sentence:

\[ (92) \text{John-wa Bill-o Bill-ga Boston-ni ki-ta toki} \]

\[ \text{Tom-ni syookai-si-ta.} \]

\[ (93) \text{John-wa Bill-o Tom-ga Bill-o suisen-si-ta-node} \]

\[ \text{zyuuyaku-ni ninmei-si-ta.} \]

Then, the constituent subject or object referring back to the matrix object is Pronominalized:
    come time introduce-do
John introduced Bill to Tom when he came to Boston.

(95) John-wa Bill-o Tom-ga suisen-si-ta-node zyuyaku-ni
      ninmei-si-ta.
    recommend-do for executive appoint
John appointed Bill executive since Bill recommended him.

Pronominalizability of the constituent subject and object re-
   ferring back to the matrix subject is not influenced by the
   shortness of the matrix sentence. One can say:

(96) John-wa Bill-o Boston-ni ki-ta toki mi-ta.
    come time see
John saw Bill when he came to Boston.
This Japanese form is of course ambiguous in the same way that
the English is. The ambiguity will disappear if the deleted PRO
in (96) is replaced by zibun. But then zibun refers back to
the matrix subject John. Thus, again, the constituent subject
or object can be Pronominalized but not Reflexivized when it
refers back to the matrix object.

Finally, word-order change may put the matrix subject after
the matrix object or the constituent subject or object. But
in such situations the matrix subject can neither be Pronominalized
nor Reflexivized. Thus, if Pronominalization or Reflexivization
were applied to the following:

(97) John-o John-ga mi-ta.
    John John saw.

(98) John-ga Boston-ni ki-ta toki John-ga Bill-o Tom-ni
      syookai-si-ta.
    come time introduce-do
When John came to Boston, John introduced Bill to Tom.

(99) Bill-ga John-o mi-ta toki John-ga hon-o yon-de i-ta.

see time book read be

When Bill saw John, John was reading a book.

the resulting forms could not be taken as having been derived
from the above:

(100) John-o mi-ta.

see

PRO saw John.


come time introduce-do

When John came to Boston, PRO introduced Bill to Tom.

(102) Bill-ga John-o mi-ta toki hon-o yon-de i-ta.

time book read be

When Bill saw John, PRO was reading a book.

(103) John-o zibun-ga mi-ta.

see

I saw John.

(104) John-ga Boston-ni ki-ta toki zibun-ga Bill-o Tom-ni

syookai-si-ta.

come time introduce-do

When John came to Boston, I introduced Bill to Tom.

(105) Bill-ga John-o mi-ta toki zibun-ga hon-o yon-de i-ta.

see time book read be

When Bill saw John, I was reading a book.

In these sentences, PRO and zibun should be taken as independently
chosen by the lexical rule. According to the circumstances. PRO
may be rendered as I, he, etc. Zibun is to be taken as one form of the first person noun in a particular style or social dialect. The fact treated in this paragraph is easily taken care of by stipulating that when Reflexivization and Pronominalization are applied, the subject is located at the head of the sentence.

5. To conclude, we will now state the fundamental condition of Reflexivization as follows: Referring back to the main subject, Reflexivization applies obligatorily on the main object and on the constituent object dominated by the main node VerbPhrase, and optionally on the constituent subject. The applicability of Reflexivization is therefore much wider in Japanese than it is in English, where the condition is simply application within the simple sentence.

Apparent counterexamples to this fundamental condition in Japanese will probably emerge. But counterexamples observed on the surface level may well be due to the intervention of some other grammatical factors on a deeper level, so that as essential revision of the fundamental condition itself would not be necessarily called for.

The so-called passive construction presents what appears to be a counterexample. The passive sentence:

(106) John-wa Bill-ni mi-rare-ta.

\textit{see-pass}

John was seen by Bill.

is assumed to have the underlying form:

(107) John-wa (Bill-ga John-o mi) Comp \textit{rare-ta}.  

Apparently this has a formal similarity to the causative construction, in that in both cases the constituent sentence is directly attached to the (auxiliary) verb. But notice that John in the complement of (107) is deleted in the actual speech form (106), rather than replaced by zibun, which would be expected from the general statement given above. Thus it would seem that the Reflexivization rule should be provided with an exceptional prohibiting condition referring to the passive auxiliary verb.

However, the passive auxiliary verb may be seen not as an isolated exception, but as one case of a more general grammatical phenomenon responsible for a set of apparent counterexamples to our fundamental condition on Reflexivization.

To see this, let us consider the (auxiliary) verb -te morau. Syntactically it behaves in a way similar to the causative case (for a more exact account, see Chapter VI), and we can have the following sentence frame:

\[(108) \quad N_1\text{-}ga \quad N_2\text{-}ni \quad VP \quad \text{-}te \quad morau\]

\(N_1\) and \(N_2\) are the matrix and constituent subjects, respectively. The meaning of this form may be rendered as "\(N_1\) (asks and) gets \(N_2\) to do \(VP\)". We have said that the actual speech form (24), which we repeat here,

\[(109) \quad \text{John-ga Bill-ni mi-sase-ta.} \]

John made Bill see PRO.

is not to be taken as derived from the basic form:

\[(110) \quad \text{John-ga Bill-ni John-o mi-sase-ta.} \quad \text{see}\text{-}make \]

John made Bill see John.

If -te morau is substituted for sase in (109), we will get the form:
(111) John-ga Bill-ni mi-te morat-ta.
     see get to
     John got Bill to see him.

and this form, as the above translation may indicate, can naturally be understood with the deleted object John; that is, this can be understood as derived from the basic form parallel to (110):

     see get to
     John got Bill to see John.

In principle, then, (111) is ambiguous, also being possibly derived from:

(113) John-ga Bill-ni PRO-o mi-te morat-ta.
     John got Bill to see PRO.

The following pairs may be added:

(114a) John-ga Bill-ni suisen-sase-ta.
     John made Bill recommend PRO.

(114b) John-ga Bill-ni suisen-si-te morat-ta.
     John got Bill to recommend him.

(115a) John-ga Bill-ni syootai-sase-ta.
     John made Bill invite PRO.

(115b) John-ga Bill-ni syootai-si-te morat-ta.
     John got Bill to invite him.

(116a) John-ga Bill-ni yurus-ase-ta.
     John made Bill forgive PRO.

     John got Bill to forgive him.
The difference shown between the sase form and the -te mcraw form is due to the fact that the latter has the semantic implication that the action of the constituent sentence is done in favor of, or for the benefit of the matrix subject. This implication makes it possible for the deleted object of the constituent verb to be understood as referring to the matrix subject. Still, it is possible to replace the constituent object with zibun instead of deleting it, as in:

(117) John-ga Bill-ni zibun-o mi-te morat-ta.
John got Bill to see him.

John got Bill to recommend him.

Thus the constituent object coreferential with the matrix subject is still Reflexivizable; what is new is its deletability.

Another example of this sort is supplied by the (auxiliary) verb -te kure. With regard to the meaning of this verb, it can probably be said that in the simple sentence it always implies the benefit of the speaker while in the complex sentence it could also imply the benefit of the matrix subject. Thus, let us add -te kure after the verb kakumaw ("shelter") in the constituent sentence in (64):

(119) John-wa Bill-ga zibun-o kakumat-e kure-ta ie-o mi-te
shelter house see be
iru.

John is looking at the house in which Bill sheltered him.
The deletion of zibun here seems quite permissible:

(120) John-wa Bill-ga kakumat-te kure-ta ie-o mi-te iru.

Here again it is the semantic implication of the form -te kure that seems responsible for the deletability of the constituent object coreferential with the matrix subject. The following pairs may be added for comparison:

(121a) John-wa Bill-ga suisen-suru koto-o kitai-si-ta.

recommend expect
John expected Bill to recommend PRO

(121b) John-wa Bill-ga suisen-si-te kureru kote-o kitai-si-ta.

John expected Bill to recommend him.


invite ask
John asked Bill to invite PRO.

(122b) John-wa Bill-ga syootai-si-te kureru kote-o tanon-da.

John asked Bill to invite him.

(123a) John-wa Bill-ga yurusu koto-o nozon-da.

forgive hope
John hoped that Bill would forgive PRO.

(123b) John-wa Bill-ga yurusi-te kureru kote-o nozon-da.

John hoped that Bill would forgive him.

One may call the two verbs treated above first person dative verbs, since they have the implication of dativus commodi of the speaker, if they are in the simple sentence, and of the matrix subject, if they are in the constituent sentence. There are also the verbs, -te age and -te yar, which may be called non-first person dative verbs, which incorporate within them the feature of dativus commodi of the suitably understood
non-first person.

Let us now return to the passive sentence with which we began our present discussion. We have observed that, in spite of their morphological similarity, the causative and passive verbs sase and rare treat the constituent object coreferential with the matrix subject differently: the former Reflexivizes it and the latter deletes it. It should be noted, however, that the Japanese passive sentence is, in principle, not neutral as it is in English, but carries an implication of disadvantage for the subject. Semantically, then, the passive verb can also be understood as an instance of the dative verb, the verb of dativus incommodi. Syntactically, then, the passive verb can also be understood as an instance of the dative verb, the verb of dativus incommodi. Syntactically it actually parallels the verb of dativus commodi, -te moraw, in its treatment of the constituent object coreferential with the matrix subject.

The objection may be raised that in the case of -te moraw Reflexivization may also be applied on the constituent object, while it may not in the case of passivization. It is true that most commonly the object is deleted in passivization if it is identical with the matrix subject, but after closer observation it will seem better to assume that in principle Reflexivization is permissible here as well. Indeed, the form:

(124) John-wa Bill-ni zibun-o mirare-ta.

see-pass

John was seen by Bill.

is not to be considered totally ill-formed. Furthermore let us
consider the following form, syntactically well-formed if not semantically normal:

(125) John was stolen by Bill.

To express the idea of this sentence in Japanese, one would expect to have the corresponding form:

(126) John-wa Bill-ni nusum-are-ta.

steal-pass

derived from:


However, as an actual speech form (126) is most naturally interpreted as derived from:

(128) John-wa Bill-ni PRO-o nusum-are-ta.

PRO will refer to some belonging of John's implicitly understood in the discourse context. This of course is due to the fact that generally one steals something, not someone. To effectively convey the idea of (125), one would quite probably say:

(129) John-wa Bill-ni zibun-o nusum-are-ta.
FOOTNOTES

1 For a generative treatment of English Reflexivization, see Lees-Klima (1963).

2 For the complement construction in general see chapter VI. For the causative construction in particular see also Kuroda (1965).

3 The forms (21) and (23) may sound somewhat unnatural. Indeed sentences (10) - (12) do not sound quite natural either, probably because of some semantic fact peculiar to the verb mi ("see"). If the ambiguity of (21) and (23) is not immediately obvious, in order to follow our discussion it would be advisable to add the modifying clause kagami-no naka-no ("in the mirror") or to substitute the verb but ("hit") for mi ("see"). Thus:

John-ga Bill-ni kagami-no naka-no zibun-zisin-o mi-sase-ta.

mirror inside

John made Bill see him(self) in the mirror.

John-ga Bill-ni zibun(-zisin)-o but-ase-ta.

hit-make

John made Bill hit him(self).

4 Since later topics do not depend on the discussion that follows, the reader may proceed to the next section if he prefers.
This observation was brought to my attention by Mr. G. Itasaka of Harvard University.

Main subject here will refer either to the subject of the simple sentence or the matrix subject of the complex sentence.

For example it is well known that zibun was used as the first person noun in the Japanese armed forces.

For a discussion of the so-called passive sentence, see Chapter VI. Here, in particular, it should be noted that the Japanese passive sentence clearly involves the constituent sentence, contrary to the case of the passive sentence in English.
1. In chapter II it was explained that the main use of the particle *ga* is to mark the subject; many of the previous examples show that the object, on the other hand, is marked by the particle *o*. Up to this point it has been tacitly assumed that these particles are generated in the phrase structure. Thus, putting aside for a while constituents other than subject and object, we may have the rules:

(1) \( S \rightarrow NP \ ga \ VP \ Aux \)
(2) \( VP \rightarrow NP \ o \ V \)

These rules will correspond to the following familiar rules in English:

(3) \( S \rightarrow NP \ Aux \ VP \)
(4) \( VP \rightarrow V \ NP \)

If these two systems are compared from a purely formal point of view, it can be seen that the former system is less economical, for *ga* and *o* are essentially redundant. The rules:

(5) \( S \rightarrow NP \ VP \ Aux \)
(6) \( VP \rightarrow NP \ V \)

will suffice to determine which NP in the string \( NP \ NP \ V \ Aux \) is the subject and which the object of the sentence. The
particles ga and o which appear on the phonetic level may then be supplied by the transformational rules:

(7) \( \delta \rightarrow \text{ga} \quad \text{in env.} \quad \#\text{NP} \quad \)
(8) \( \delta \rightarrow \text{o} \quad \text{in env.} \quad \text{NP} \quad \text{V} \)

This explanation remains valid even if some adverbial phrases intervene between the subject and the object.

But the simplification of the phrase structure obtained by replacing (1), (2) with (5), (6) is counteracted by the complication of the transformational part resulting from the introduction of (7) and (8), so that it may not be immediately clear which way is to be taken. However, further observation will indicate that the introduction of the particles ga and o by a transformational rule is to be preferred. More precisely, let us look at the following. The sets of rules (1) and (2) on the one hand and (7) and (8) on the other will give different structural significance to the particles ga and o. The former set gives a substantial interpretation of the particles and the latter a formal interpretation; in the former the particles will be associated exclusively with the grammatical notion of subject and object, while in the latter they are characterized by a certain formal property on some level of the transformational component. It has been made rather clear that the distinction between the nominative and accusative cases in English (though actually realized only by the personal pronouns, e.g., I vs. me, etc.) is formal rather than substantial. The main purpose of this chapter is to show that the same is true for Japanese with respect to the particles ga and o, which are usually taken as the
subject and object markers, respectively. For this purpose, of course, the formal interpretation (7), (8) will have to be duly refined.

Particles other than ga and o may also appear in actual speech forms. They are usually contained in an adverbial phrase of some sort or other, e.g., Tokyo-de or Tokyo-ni (in Tokyo", niciyoo-ni ("on Sunday"), isi-de ("with stone"). In the following discussion we will not concern ourselves with the level on which these particles are to be introduced but will simply assume that they are introduced before application of the rules which insert ga and o. We will call noun phrases marked if they have these particles attached. It is thus assumed that just before the insertion rules are applied, at most those noun phrases which eventually acquire the particle ga or o may be left unmarked.1

2. So far as simple sentences are concerned, either of the sets of rules (1), (2) and (5), (6), (7), and (8) will generate the right forms, and we will not have much to say about their evaluation from a purely formal point of view. In English the formal character of the case distinction is revealed by passivization within the range of simple sentences. But as was observed in the preceding chapter, passive sentences are complex in Japanese, and the formal nature of the particles ga and o is revealed only after the extension of our discussion to the complex sentence. Actually the problem becomes the investigation of certain aspects of sentence embedding.
In English three types of sentence embedding can be distinguished: clausal, infinitival, and gerundial. In each of the three cases, embedding the sentence does not change its structure, except possibly for its subject and auxiliary. In clausal embedding virtually no change occurs; the subject and the auxiliary system of the independent sentence are kept intact (except for possible intervention of the subjunctive mood and the sequence of tense). In gerundial embedding the verb takes the present participial form and the subject is expressed, if at all, in the genitive case. In infinitival embedding the verb takes the infinitive form and the subject is expressed, if at all, in the accusative case with or without the preposition for.

We will not attempt an exhaustive survey of the types of sentence embedding in Japanese. As a general remark we can note that as in English embedding, constituents other than the subject and the auxiliary do not undergo any change. We will not specify in exact terms what we mean by the auxiliary. For our discussion it suffices to note that the auxiliary is a tense marker, present or past, or some other particles attached to the end of the verb phrase, e.g., yoo. The auxiliary system does not change in the embedded sentences in relativizations or nominalization. Thus:

(9a) John-ga ka-u hon ..
    buy    book
    book which John (will) buy ..

(9b) John-ga kat-ta hon ...
    buy    book
    book which John bought ...
(10a) John-wa Bill-ga hon-o ka-u-to omot-ta.
       book buy think
       John thought that Bill would buy books.
(10b) John-wa Bill-ga hon-o kat-ta-to omot-ta.
       book buy think
       John thought that Bill had bought books.

Some verbs require a special auxiliary, as in:
       book buy
       John asked Bill to buy books.

Let us call cases like the above, in which the tense marker is preserved after embedding, clausal embedding. There are other verbs which require the embedded sentence to lose its tense marker:
(12)  John-wa Bill-ni hon-o kaw-ase-ta.
       book buy-make
       John made Bill buy books.
(13)  John-wa Bill-ni hon-o kat-te morat-ta.
       book buy get
       John got Bill to buy books.

We will call this type of embedding nonclausal. The behavior of the subject in embedding will be of more interest to us here than the behavior of the auxiliary.

3. Let us discuss in this section the subject of clausal embedding. Consider the following sentences:
John expected that Bill would buy books.

This is a typical nominalized embedding and no change has taken place inside the embedded sentence. The English translation may be said to represent faithfully the embedding structure in the Japanese sentence, except for the sequence of tense modification. Alongside (14) we may have:

(15) John-wa Bill-ni hon-o ka-u-koto-o kitai-si-ta.

Here the embedded subject appears in the **ni**-phrase. The **ni**-phrase used in a simple sentence generally denotes the indirect object, as in:

(16) John-wa Bill-ni hon-o atae-ta.

John gave books to Bill.

(17) John-wa Bill-ni hon-o morat-ta.

John got books from Bill.

Thus the following may be given as a formally faithful translation of (15):

(18) John expected of Bill that he would buy books.

One might consider the **ni**-phrase in (15) to have been originally contained in the matrix sentence. But if it were a matrix constituent, it would always be identical with the embedded subject. In other words, we do not accept such forms as:
(19) *John-wa Bill-ni Tom-ga hon-o ka-u-koto-o kitai-si-ta.

book buy expect

*John expected of Bill that Tom would buy books.

There does not seem to be any need to introduce the ni-phrase in the matrix sentence with the verb kitai-su-ru ("expect"). Hence, we assume, rather, that (15) is derived directly from (14) by a transformation. However, the ni-phrase thus derived from the constituent subject will be treated as if it were a constituent of the matrix sentence. Thus the most natural readings of (14) and (15) would have a pause before Bill-ga and after Bill-ni, and another pause after koto-o. The transformation will be formulated as follows:

(20) Constituent Subject Extraction

(NP-ga X)Comp → NP-ni (X)Comp

Note that the English sentence given in (14) is similarly transformed into:

(21) John expected Bill to buy books.

In some sense one may say that (21) is semantically as well as formally a faithful translation of (15): however, the verb phrase becomes infinitival in English but remains clausal in Japanese.

One might object to our analysis of (15) by pointing to sentences like

(22) John-wa Bill-ni seikoo-o kitai-si-ta.

success expect

John expected success from Bill.

where apparently Bill and seikoo are, respectively, matrix in-
direct and direct objects of the verb kitai-si. But the Sino-
Japanese word seikoo, though morphologically a noun, is notionally
verbal, and we can paraphrase (22), using the verbalized form
seikoo-si, with the following sentence which has the same struc-
ture as (14):

     succeed expect
     John expected that Bill would succeed.

Constituent Subject Extraction can also be applied to (23) to get:

     succeed expect
     John expected Bill to succeed.

We will then suppose that (22) is further derived from (24)
by deleting the carrier verb si ("do") with the nominalization
marker koto. We will now introduce the rule:

(25) si-Deletion
    (N-si) → N

But there are certainly cases in which the ni-phrase should be
assumed to originate in the matrix sentence. For instance in:

(26) John-wa kamisama-ni Bill-ga hon-o ka-u-yoo-ni
     God (or ka-u-koto-o)
     book buy
     o-inori-si-ta
     pray
     John prayed to God that Bill would buy books.
the matrix indirect object kamisama and the constituent subject Bill are different: but they may coincide, as in:

      God book give pray

John prayed to God that He (God) give him books.

In (27) we assume that the constituent subject is deleted. In (26) Constituent Subject Extraction cannot be applied to get:

(28) *John-wa kamisama-ni Bill-ni hon-o ka-u-yoo-ni
      o-inori-si-ta.

Some other cases are located between these two extremes, and different people may judge them differently. We shall suppose that the verbs yurus ("permit") and meizu ("order") belong to the former group and that sentences like the following are ill-formed:

(29) *John-wa Bill-ni Tom-ga hon-o-ka-u-koto-o yurusita.
      book buy permit

*John permitted Bill that Tom would buy books.

But one may disagree with this, in which case these verbs will have to be treated like inor ("pray").

In comparing Japanese with English, the following point should be noted. In English to decide whether the superficial object is derived from the matrix sentence or solely from inside the constituent sentence, it is not sufficient to consider whether the verb can choose the matrix object and the constituent subject independently. Thus, with the verb persuade the constituent subject is always identical with the matrix object, and yet one assumes the underlying form:
(30) John persuaded Bill (Bill would buy books).

for the sentence:

(31) John persuaded Bill to buy books.

A reason for giving different basic structures to sentences (21) and (31) in spite of their superficial resemblance is that (21) can be paraphrased by:

(32) John expected books to be bought by Bill.

but (31) cannot be paraphrased by:

(33) John persuaded books to be bought by Bill.

In other words, infinitivalization of the complement of the English sentence given in (14) can take place either before or after passivization is applied to the constituent sentence.

But a (superficially) similar argument does not hold in Japanese. Although we assumed that (14) was the underlying form of (15), it is not claimed that (15) can be paraphrased by

(34) *John-wa hon-ni Bill-ni kaw-are-ru-koto-o kitai-si-ta.

John expected books to be bought by Bill.

Recall, however, as noted in chapter V and to be noted again below, that the Japanese so-called passive is a generalized transformation, so that the basic form of (34):


is already different from the basic form (14).

On the whole, the passive sentence in Japanese does not occur with nonhuman (derived) subjects as freely as it does in English. But it will certainly be agreed that (34) is more highly ungrammatical than (35). This is, however, due to the additional condition on Constituent Subject Extraction, (20), that it may apply in principle only to a human subject. Thus,
Thus, it is also true that the form:

(36) *John-wa ame-ni huru-koto-o kitai-si-ta.

\[ \text{rain \ fall \ expect} \]

John expected rain to fall.

sounds strange, although its supposed source:

(37) John-wa ame-ga hur-u-koto-o kitai-si-ta.

John expected that rain would fall.

is quite all right.

4. Let us continue discussing the ni-phrase derived from the embedded subject. This section will deal with nonclausal embedding.

The Japanese so-called passive sentence involves a matrix and a constituent sentence, which are in principle independent of each other. Thus, we have:

(38) John-wa ame-ni hur-are-ta.

\[ \text{rain \ fall} \]

(39) John-wa Bill-ni hon-o kaw-are-ta.

\[ \text{book \ buy} \]

The constituent sentences of these passive sentences are, respectively,

(40) ame-ga hut-ta.

\[ \text{rain \ fall} \]

Rain fell. (It rained.)

(41) Bill-ga hon-o kat-ta.

\[ \text{book \ buy} \]

Bill bought books.

As noted in Chapter V, the passive sentence implies not only the fact expressed by its constituent sentence but also
some disadvantage suffered by the matrix subject as a result of that fact. Thus, in (38) and (39) it is implied that John somehow suffered from the facts expressed by (40) and (41). When the matrix subject is identical to the constituent object, the latter is deleted in the actual speech form, and we have, for example:

(42)  John-wa Bill-ni mi-rare-ta.

see

John was seen by Bill.

This is the case in which the Japanese passive appears to be like the English passive. But, as suggested in Chapter V, the deletion of the constituent object is to be understood within the general scheme of Pronominalization (the constituent object may even be Reflexivized in certain special cases), and there is essentially nothing special involved here.

As the above examples show, the constituent subject of the passive sentence appears in the _ni_-phrase in the actual speech form. We have no reason to assume that this _ni_-phrase originated in the matrix sentence. Thus, we will assume that the matrix sentence for passivization is:  

(43)  NP-ga (Comp-rare)\textsubscript{v} Tense.

When the constituent sentence is inserted into Comp in this formula, it loses its auxiliary (tense), and Constituent Subject Extraction (20) obligatorily applies, whether or not the constituent subject is human. Thus, for example, we have:

(44)  John-ga (ame-ga hur)\textsubscript{Comp-rare-ta}.

\rightarrow  John-ga ame-ni hur-are-ta.

Another typical kind of nonclausal complementation takes
place with the causative verb sase. There are two different causativizations using the verb sase, ni-causativization and o-causativization. The reader is referred to Kuroda (1965) for a more detailed explanation of their formal and semantic differences. Here, however, we will give a different formal explanation of causativization from the one given in the paper cited above, because we are now looking at it in a more general perspective. (The essential point of the argument in that paper remains completely valid.) First let us consider the intransitive constituent sentence:

(45) Bill-ga hatarak-u.

work

Bill worked.

The ni- and o-causativizations of this sentence with the causative agent John appear, respectively, as:


John made Bill work.

(47) John-ga Bill-o hatarak-ase-ta.

John made Bill work.

To account for (46), we have only to assume that it has the underlying form:

(48) John-ga (Bill-ga hatarak)\textsubscript{Comp}-sase-ta.

from which Bill-ni in (46) is derived by Constituent Subject Extraction (40). In other words, as the matrix sentence for the ni-causativization, we will assume the form:

(49) NP-ga (Comp-sase)\textsubscript{V-Tense}

On the other hand, we will assume that the o-phrase in the
causativization originates in the matrix sentence, which will be of the form:

(50) NP-ga NP-o (Comp-sase)y - Tense

Then (47) will have the underlying form:

(51) John-ga Bill-o (Bill-ga hatarak)Comp-sase-ta.

The ga-phrase in the complement here has to be deleted. Before trying to give a formal account of this deletion, let us consider the causative sentence with the transitive constituent sentence. On the phonetic level there is no distinction between the ni- and o-causative forms. From the constituent sentence:

(52) Bill-ga hon-o kat-ta.

only one causative (phonetic) form is derived:

(53) John-ga Bill-ni hon-o kaw-ase-ta.

To achieve semantic parallelism with the intransitive case, however, the form (53) is assumed to be ambiguous; that is, it is either the ni- or o-causativization of (52). To account for the ni-causative reading of (53), we only have to insert (52) in the Comp of (49), the ni-phrase in (53) then being automatically derived by Constituent Subject Extraction (20). On the other hand, if we insert (52) into the Comp of (50) to get the o-causative reading of (53), we will get the form:

(54) John-ga Bill-o (Bill-ga hon-o kaw)Comp-sase-ta.

From this, the ni-phrase in (53) may be explained by Constituent Subject Extraction applied to the ga-phrase in the constituent of (54). Then the o-phrase in (54) must be deleted. Thus, in o-causativization, the matrix object is deleted if the constituent sentence is transitive and the constituent subject is
deleted if the constituent sentence is intransitive. This asymmetry is not desirable, but it seems that the above is the most natural way of explaining the appearance of the o-phrase and the ni-phrase in the actual speech forms of the various causative forms. Admitting this, we will introduce the following rule:

(55) o-Phrase Deletion:

\[ \text{NP-o} \rightarrow \emptyset \text{ in env. } (XNP-oV)_{\text{Comp-sase.}} \]

It will be seen later that this rule is more general than it now appears to be. The deletion of the ga-phrase in the constituent sentence of the o-causativization with the intransitive constituent sentence can be handed over to the general process of pronominalization; that is, we will assume that Pronominalization, referring back to the main object, is applied to the subject of the complement attached to the main verb. Note that o-Phrase Deletion should then be applied before Pronominalization.

In Kuroda (1965) some semantic and syntactic similarities are indicated between the ni-causativization and the construction with the verb moraw. Some aspects of the moraw are also discussed in Chapter V. In accordance with our interpretation of the ni-causative form, the moraw form is assumed to have the matrix:

(56) \[ \text{NP-ga (Comp-te moraw)}_v\text{-tense.} \]

The constituent sentence, either transitive or intransitive, will be inserted into the Comp and then Constituent Subject Extraction (20) will apply. For example:
(57) John-wa (Bill-ga hatarak)Comp-te moraw-ta.
    → John-wa Bill-ni hatarai-te morat-ta.
(58) John-wa (Bill-ga hon-o kaw)Comp-te moraw-ta.
    → John-wa Bill-ni hon-o kat-te morat-ta.

Note that Constituent Subject Extraction (20) is obligatorily applied in the above cases of nonclausal embedding. On the other hand, moraw sentences like (57) and (58) and ni-causativization like (46) can result only from constituent sentences with a human subject. It was noted earlier that Constituent Subject Extraction (20) is applicable only to human nouns in the case of the clausal embedding treated in section 2. Let us suppose that Constituent Subject Extraction is subject to this condition in general. Then if a sentence with a nonhuman subject is inserted into the Comp of (49) or (56), this condition will conflict with the obligatory application of the rule in nonclausal complements, and we may suppose that this will lead to blocking, accounting for the nonexistence of the moraw and ni-causative sentences with non-human subject. However, it must be admitted that this conflict is resolved in favor of Constituent Subject Extraction in the case of passivization. There certainly exist passive sentences with nonhuman constituent subjects, e.g., (38).

5. Thus far we have dealt with complements dominated by the node VerbPhrase of the matrix sentence. Let us now turn to some of the sentence embeddings under the matrix subject. The English sentence

(59) John can buy books.

is most naturally translated into Japanese as
The existence of an underlying particle ni after John in (60) can be indicated by a variant form of (60):

(61) John-ni-wa hon-o ka-u-koto-ga deki-ru.

and also by the nominalization:

(62) John-ni hon-o ka-u-koto-ga deki-ru-koto

that John can buy books

Probably the form:

(63) John-ni hon-o ka-u-koto-ga deki-ru.

is rather rare as an actual speech form, but the particle ga may appear:

(64) John-ga hon-o ka-u-koto-ga deki-ru.

John can buy books.

Also, ni may be replaced in the nominalization by ga:

(65) John-ga hon-o ka-u-koto-ga deki-ru-koto

that John can buy books

We will suppose that we have the basic form:

(66) ((John-ga hon-o ka-u)Comp-koto)NP -ga (deki)VP-ru

The ni-phrase in (61) and (63) is then explained by Constituent Subject Extraction (20).

The verb deki may be directly preceded by a noun. For example one may say:

(67) John-wa doicugo-ga deki-ru.

German can

But, in this case again, it is understood that John is the subject of some action which is in a natural way implied by the
noun doicugo, probably the action of speaking (but possibly the action of reading, writing etc.) Thus we may assume that (67) is derived from:

(68) John-wa doicugo-o hanas-u-koto-ga deki-ru.

German speak can

John can speak German.

Actually, in this context the verb hanas does not add much information to the sentence. On the other hand when a noun is such that it is not particularly associated with a certain action, the verb before deki-ru cannot be deleted. We cannot say something like:

(69) *John-wa hon-ga deki-ru.

The particle ni may also appear in such forms as (67):

(70) John-ni doicugo-ga deki-ru koto

that John can (speak) German

An exact generative account of the particle ga following doicugo in (67) and (70) will be given later.

There is a group of adjectives which show a complete parallelism with the verb deki in their sentence making. Thus, we have, for example:

(71) John-(ni-)wa doicugo-o hanas-u-koto-ga muzukasi-i.

German speak difficult

It is difficult for John to speak German.

(72) John-ni doicu-go-o hanas-u-koto-ga muzukasi-i-koto

that it is difficult for John to speak German

(73) John-ga doicugo-o hanas-u-koto-ga muzukasi-i (koto)

(that) it is difficult for John to speak German

It will be assumed that we have the basic form:
The noun doicugo may directly precede the adjective muzukasi:

(75) John-(ni-)wa doicugo-ga muzukasi-i.
(76) John-ni doicugo-ga muzukasi-i koto.

In this case the deleted verbal notion should probably be assumed to be naraw ("learn"). The underlying form is then:

(77) ((John-ga doicugo-o narau)Comp-koto) NP-ga
    (muzukasi) VP-i

6. Another group of adjectives occur in a construction superficially identical to that in (75) and (76). Thus:

(78) watasi-ni-wa ongaku-ga tanosi-i.
    I music amusing
    Music is amusing to me.
(79) watasi-ni ongaku-ga tanosi-i-koto
    that music is amusing to me

or:

(80) watasi-ni-wa zisin-ga kowa-i.
    I earthquake fearful
    I am afraid of earthquakes.
(81) watasi-ni zisin-ga kowa-i koto.
    that I am afraid of earthquakes

One may expect these forms to be explained like (75) and (76); in the case of (78) and (79) it can be supposed that the verb kik ("listen") is missing. Indeed, one can say:

(82) watasi-ni-wa ongaku-o kik-u-koto-ga tanosi-i.
(83) watasi-ni ongaku-o kik-u-koto-ga tanosi-i-koto.
which parallel the sentences (71) and (72), respectively. However, the form which parallels (73) is not possible:

(84) *watasi-ga ongaku-o kik-u-koto-ga tanosi-i.

In the case of (80) and (81) it may be difficult to find a suitable verb to be restored.

The adjectives of this group possess a corresponding verbal form having the suffix -gar, mentioned in chapter V. Moreover, as was also noted there, the adjectival forms can usually be used only with the first person. Examples of sentences with -gar-verbs are:

(85) watasi-ga ongaku-o tanosi-gar-u.
     music be amused

(86) I am amused by music.
     John is

(87) watasi-ga zisin-o kowa-gar-u.
     earthquake fear
     I am afraid of earthquakes.
     John is

One may also say:

(88) watasi-ga ongaku-o kik-u-koto-ga tanosi-gar-u.
     music listen be amused

     I am amused by listening to music.
     John is

Sentences like (85) - (87) will obviously be treated as ordinary transitive sentences. In (87) the object is the nominalized complement:

(88) watasi-ga ongaku-o kik-u-koto.
     that I listen
     John listens to music
from which the subject will be deleted in the actual speech form. Returning now to sentences (78), (80), and (82), our first suspicion is that they involve sentence embedding and that the ni-phrase at the head of each sentence is the embedded subject. On the other hand, it is legitimate to say that the ideas expressed by sentences (85) - (87) are contained in sentences (78), (80), and (81), respectively. Then it would seem natural to think that the former are really embedded in the latter. But then what would the matrix sentence of the latter be?

The particle ga before the adjectives in those sentences may suggest that ongaku, zisin, and ongaku-o kik-u-koto are the matrix subjects (and at the same time the constituent objects). On the other hand, one may prefer to consider watasi the matrix subject in view of the clear semantic parallelism between, say:6

(89) \( \text{watasi-wa zisin-ga kowakat-ta.} \)
I was afraid of earthquakes.

(90) \( \text{John-wa zisin-o kowagat-ta.} \)
John was afraid of earthquakes.

Formal support can, in fact, be given to this semantic argument. Note that we have the following sentences:

(91) \( \text{watasi-wa tanosi-i.} \)
amused
I am amused (or cheerful, happy, etc.)

(92) \( \text{watasi-wa kowa-i.} \)
I fearful
I am frightened.
Compared with (78) and (80), these sentences lack not only
the ga-phrase that specifies the object of the human feeling
represented by the adjectives tanosi-i and kowa-i, but also the
particle ni after watasi. The absence of a ga-phrase does not
mean that it has been pronominalized and disappears on the
surface level. We will assume, that it never appears in the
basic forms. Compare (91) and (92) with:

(93)  watasi-ni-wa tanosi-i.

and

(94)  watasi-ni-wa kowa-i.

In these sentences, some definite thing is clearly implied, and
they should be translated as:

(95)  I am amused with it.

and

(96)  I am afraid of it.

On the other hand, sentences (91) and (92) describe the present
state of mind of the subject without specifying any particular
object. Now, to give a formal argument, the fact that ni cannot
appear in (91) and (92) will suggest that the noun phrase watasi
is not an embedded subject but rather the real matrix subject.
But if (78) and (80) on the one hand and (91) and (92) on the
other are to be considered different only in the existence or
absence of the ga-phrase before the adjective, then the above
argument will lead us to recognize that all of these sentences
contain identical matrix and constituent objects, namely watasi,
in their basic forms, but in the actual speech forms, the matrix
subject has been deleted in the former pair and the constituent subject in the latter.

Let us formulate in more exact terms what is suggested above. We will assume one dictionary entry for each adjective and verb pair such as *tanosi-i* and *tanosi-gar-u*. This entry can be used either transitively or intransitively, and we may have, in a straightforward way:

(97)  John-ga kowa-gat-ta.
John was afraid.

John was afraid of earthquakes.

(99)  John-ga tanosi-gat-ta.
John was happy.

(100) John-ga ongaku-o tanosi-gat-ta.
John was amused by music.

In addition, we will assume an abstract adjective denoted by F. This adjective, in the ordinary style, can take only the first person noun as its subject and requires a complement which has the same subject as the matrix (hence the first person noun) and which includes a verb like *tanosi-i* or *kowa-i*. Thus, we may have the following underlying forms:

(101)  watasi-ga (watasi-ga tanosi)\text{Comp-F} - \text{past}

(102)  watasi-ga (watasi-ga ongaku-o tanosi)\text{Comp-F} - \text{past}

(103)  watasi-ga (watasi-ga kowa)\text{Comp-F} - \text{past}

(104)  watasi-ga (watasi-ga zisin-o kowa)\text{Comp-F} - \text{past}

In (101) and (103), where the verbs *tanosi* and *kowa* are used intransitively, the constituent subject (i.e., the second
Watasi) must be deleted, while in (102) and (104), where the verbs are used transitively, it is the matrix subject (i.e., the first watasi) that must be deleted. Note that this deletion condition parallels the deletion condition in -o-causativization formulated in the -o-Phrase Deletion Rule (55): the matrix object is deleted just in case the complement is a transitive sentence. Thus, we can generalize rule (55) as follows:

(105) ga/o-Phrase Deletion

\[ \text{NP}_{\bar{o}} \rightarrow \emptyset \quad \text{in env.} \quad (X-\text{NP-o-V})_{\text{Comp}} \]

The formulation of this rule is still provisional and it will be shown later in (133) that it is not necessary to mention the particles ga and o. The deletion of the constituent subject in the intransitive case will be taken care of by the general procedure of Pronominalization, though we will have to specify that Pronominalization, not Reflexivization, is to be applied to the constituent subject in this particular case. The constituent subject in (102) or (104), which survives rule (105), will be converted into the ni-phrase by Constituent Subject Extraction (20). Thus, from (101) and (102), we will generate actual speech forms in the following way:

(101) watasi-ga (watasi-ga tanosi)_{\text{Comp-F-past}}

(106) by Pronominalization:

watasi-ga tanosi-F-past

(107) by morphophonemic rules:

watasi-ga tanosikat-ta.
(102) watasi-ga (watasi-ga ongaku-o tanosi) Comp-F - past

(108) by ga/o-Phrase Deletion (105):

(watasi-ga ongaku-o tanosi) Comp-F - past

(109) by Constituent Subject Extraction (20):

watasi-ni ongaku-o tanosi-F-past

(110) by morphophonemic rules:

watasi-ni ongaku-ga tanosi kat-ta.

We have not yet explained why the particle ga appears after ongaku in (110). The explanation will be given in the following section, which will be devoted to the general problem of how to generate the particles ga and o.

As the last example of sentence embedding, we will take up a construction that is semantically similar to the deki ("can") sentence treated in section 5 but which structurally belongs here, that is, the so-called potential form with the suffix (rar)e.7

(111) John-wa hon-ga ka-e-ru.

book buy

John can buy books.

(112) John-wa hatarak-e-ru.

work

John can work.

It is clear that these sentences are somehow related to the simple sentences:

(113) John-ga hon-o ka-u.

John buys books.

(114) John-ga hatarak-u.

John works.
Note that here again the object _hon-o_ of the verb _kaw_ appears in the _ga_-phrase in (111). But our present concern is, rather, the fact that the particle _ni_ underlies the _wa_-phrase in (111) but not in (112). It is possible to say:


John can buy books.

but not:


John can work.

Following the same argument as above, we will assume that (111) and (112) (disregarding the attached _wa_) have the following basic forms:

(117)  John-ga (John-ga hon-o kaw)_Comp-e-ru

(118)  John-ga (John-ga hatarak)_Comp-e-ru

_Ga/o_-Phrase Deletion (105) should then be revised to include the potential verb _rar_e in the specification of the environment. We will incorporate this revision when the rule is rewritten in the following section.

7. After the above observations on sentence embedding, we will now return to the problem posed at the beginning of this chapter: how to generate the particles _ga_ and _o_. We know that in simple sentences, the particles _ga_ and _o_ are found, respectively, in subject and object noun phrases. However, it has been observed that the _ga_-phrase does not necessarily represent either the matrix subject or the constituent subject in the actual speech form of the complex sentence; often the
constituent object appears in the ga-phrase. To cite examples from the preceding discussion:

John can speak German.

(120) John-ni doicugo-ga muzukasi-i.
German is difficult for John.

(121) watasi-ni zisin-ga kowa-i.
I am afraid of earthquakes.

John can buy books.

Note that in these cases the matrix subject is in some sense lost. Indeed, in (119) and (120) the matrix subject is the nominalized sentence:

(123) John-ga doicugo-o hanas-u (or nara-u)-koto
that John speak (or learn) German
from which the final part hanas-u (or nara-u) koto is deleted.
In (121) and (122) the matrix subject is deleted by ga/o-Phrase Deletion. But this deletion of the matrix subject is, so to speak, compensated for by the attachment of ga to the constituent object, so that on the surface level there still appears to be a subject.

In section 1 we noted that in the simple sentence the particle ga can be formally interpreted by saying that it is attached to the first noun phrase in the sentence, and this formal interpretation is equivalent to the substantial interpretation that ga is the subject marker. We have now seen that the latter interpretation of ga is not generalizable to
cover the case of the complex sentence. But the formal interpretation can be generalized, as we will see below.

The sentence may contain noun phrases other than the subject and object. But, as mentioned in section 1, we assume that appropriate particles have already been attached to those other noun phrases. We call a noun phrase with a particle attached to it marked. It is now assumed that the subject and object are not marked in the basic form of the sentence. The formal interpretation of *ga* and *o* in the simple sentence may be restated as follows: attach *ga* to the first unmarked noun phrase in the sentence; if the sentence still contains an unmarked noun phrase, attach *o* to that noun phrase. Let us assume that this rule is now applied cyclically, first to the embedded simple sentence and then to the matrix sentence. If no deletion is involved in sentence embedding, this cyclic application will immediately give the correct speech form.

For example, let us generate (15) and (39), which we repeat as (124) and (125), respectively:


John expected Bill to buy books.

(125) John-ga Bill-ni hon-o kaw-are-ta.

Bill bought books, to the disadvantage of John.

The basic form of (124) will now be assumed to be:

(126) (John)_{NP}(((Bill)_{NP}(hon)_{NP}(kaw)_{VP-u})_{Comp-koto})_{NP} (kitai-si)_{VP-ta}
In the first cycle, ga is attached to Bill and then o is attached to hon. Constituent Subject Extraction (20) will then yield the string:

\[(127) \quad (\text{John})_{\text{NP}}(\text{Bill})_{\text{NP}}-\text{ni}(\text{hon}-\text{o ka-u-koto})_{\text{NP}}(\text{kitai-si})_{\text{VP}}-\text{ta}.\]

In the second cycle ga and o will be attached to John and hon-o ka-u-koto, respectively, and the actual speech form (124) will result. On the other hand the basic form of (125) will be:

\[(128) \quad (\text{John})_{\text{NP}}(\langle(\text{Bill})_{\text{NP}}(\text{hon})_{\text{NP}}(\text{kaw})_{\text{VP}}\rangle_{\text{Comp-rare}})_{\text{VP}}-\text{ta}\]

After the first cycle we will have

\[(129) \quad (\text{John})_{\text{NP}}(\langle(\text{Bill})_{\text{NP}}(\text{ga})_{\text{NP}}(\text{hon})_{\text{NP}}(\text{kaw})_{\text{VP}}\rangle_{\text{Comp-rare}})_{\text{VP}}-\text{ta}\]

Constituent subject Extraction will then produce:

\[(130) \quad (\text{John})_{\text{NP}}(\langle(\text{Bill})_{\text{NP}})_{\text{NP}}-\text{ni}(\text{hon})_{\text{NP}}\rangle_{\text{NP}} \text{ kaw-are-ta}\]

In the second cycle ga will be attached to John, yielding (125).

When deletion is involved, as in the case of (119) - (122), the cyclic application of the rule introduced above does not seem to work well, since, for example, in (119) ga is attached to the noun phrase doicugo to which the particle o should have been attached in the first cycle. But this suggests that the noun phrase with o attached should be treated as unmarked.

We will thus formulate the rule as follows:

\[(131) \quad \text{ga/o-Insertion}\]

\[o \rightarrow \begin{cases} \text{ga} \\ \text{in env.} \end{cases} \# \text{X#NP(o) #} \]

where X does not contain #NP(o)#

This rule may produce a string of the form NP-o-ga, from which the particle o will have to be deleted. But this deletion can
be understood in a more general scheme. We are familiar with the fact that the particles ga and o are deleted if any of the particles wa, mo, demo, or, in general, any one of the so-called hukuzyosi is attached after them. Thus we may have the rule:

(132)  ga/o-Deletion

\( \frac{\text{ga}}{o} \rightarrow \emptyset \quad \text{in env. \_\_\_\_ \text{-particle.}} \)

With these two rules, we can now generate the particles ga and o in (119) – (122). Before giving examples, we will reformulate the ga/o-Phrase Deletion Rule (105) as follows without mentioning the particles ga or o:

(133)  Matrix Subject/Object Deletion

\( \frac{\#NP\#}{\rightarrow \emptyset \quad \text{in env. \_\_\_\_} (X(Y#NP#Z)\text{VP-W})_{\text{Comp}}}
\)

\( \{(\text{sase}) \}
\)

\( \{(\text{rar})e\} \)

Now let us generate (119) and (121) as examples.

(134)  basic form of (119):

\(((\text{John})_{\text{NP}}((\text{doicugo})_{\text{NP}} \text{hanas})_{\text{VP-u}})_{\text{Comp}}-\text{koto}_{\text{NP}}\)

\((\text{deki})_{\text{VP-ru}}\)

(135)  by ga/o-Insertion (131) applied inside Comp:

\(((\text{John})_{\text{NP}}-\text{ga}((\text{doicugo})_{\text{NP}}-o \text{hanas})_{\text{VP-ru}})_{\text{Comp}}-\text{koto}_{\text{NP}}\)

\((\text{deki})_{\text{VP-ru}}\)

(136)  by Constituent Subject Extraction (20):

\((\text{John})_{\text{NP}}-\text{ni}(((\text{doicuga})_{\text{NP}}-o \text{hanas})_{\text{VP-ru}})_{\text{Comp}}-\text{koto}_{\text{NP}}\)

\((\text{deki})_{\text{VP-ru}}\)

(137)  by si-Deletion (25):

\((\text{John})_{\text{NP}}-\text{ni} (\text{doicugo})_{\text{NP}}-o (\text{deki})_{\text{VP-ru}}\)
(138) by ga/o-Insertion (131) applied to the matrix:
(John)_{NP-ni} (doicugo)_{NP-o-ga} (deki)_{VP-ru}

(139) by ga/o-Deletion (132):
John-ni doicugo-ga deki-ru. (=119)

(140) basic form of (121):
(watasi)_{NP-}(((watasi)_{NP}(zisin)_{NP}(kowa)_{VP})_{Comp-F})_{VP-i}

(141) by ga/o-Insertion (131) applied inside Comp:
(watasi)_{NP-}((watasi)_{NP-ga}(zisin)_{NP-o-kowa})_{VP}_{Comp-F})_{VP-i}

(142) by Matrix Subject/Object Deletion (133):
(((watasi)_{NP-ga}(zisin)_{NP-o-kowa})_{VP}^{\text{Comp}})^{\text{Comp-F})}_{VP-i}

(143) by Constituent Subject Extraction (20):
(watasi)_{NP-ni}(((zisin)_{NP-o-kowa})_{VP}^{\text{Comp-F})}_{VP-i}

(144) by ga/o-Insertion (131) applied to the matrix:
(watasi)_{NP-ni}(((zisin)_{NP-o-ga-kowa})_{Comp-F})_{VP-i}

(145) by ga/o-Deletion (132):
(watasi)_{NP-ni}(((zisin)_{NP-ga-kowa})_{Comp-F})_{VP-i}

(146) by morphophonemic rules:
watasi-ni zisin-ga kowa-i. (=121)
The formal interpretation of the particles \( \text{ga} \) and \( \text{o} \) by rule (131) thus succeeds in explaining the occurrence of \( \text{ga} \) in such sentences as (119) - (122), which seems difficult to explain under the substantial interpretation.

The effectiveness of rule (131) does not end with the explanation of \( \text{ga} \)-phrases of accusative origin, however. In Japanese many verbs are made from a Sino-Japanese compound word and the verb \( \text{si} \) ("do"), e.g., \( \text{kitai-si} \) ("expect"), \( \text{seikoo-si} \) ("succeed"). These Sino-Japanese words are morphologically nouns, and we may assume that the resulting verbs are compound verbs with the inner structure (NP-\text{si}). For convenience we will refer to these verbs as Sino-Japanese verbs. Now, when a Sino-Japanese verb is used intransitively, the particle \( \text{o} \) may appear, in principle, between the Sino-Japanese noun and the verb \( \text{si} \). Thus, alongside:

(147) \hspace{1cm} \text{John-ga seikoo-su-ru.}

John will succeed.

we may have:

(148) \hspace{1cm} \text{John-ga seikoo-o su-ru.}

Instead of supposing that one of these is an intransitive sentence with the intransitive verb \( \text{seikoo-su-ru} \) and the other is a transitive sentence with the object \( \text{seikoo} \), it seems reasonable to suppose that the two sentences are generatively related. In fact it is seen that \( \text{ga/o-Insertion} \) (131) applied to (147) will insert \( \text{o} \) in the right place to yield (148), although then we have to assume that the application of the rule is not obligatory in this case. Further-
more, in conformity with rule (131), this insertion of o inside the Sino-Japanese verb does not take place when it is used transitively. We have:

(149) John-ga bucurigaku-o kenkyuu-su-ru.

physics research

John does research in physics.

but not:

(150) *John-ga bucurigaku-o kenkyuu-o su-ru.

Sometimes, however, the object may be put in an adnominal form, and it then appears to modify the Sino-Japanese nominal part of the Sino-Japanese verb. In that case the particle o necessarily appears inside the Sino-Japanese verb:

(151) John-ga bucurigaku-no kenkyuu-o su-ru.

but not:

(152) *John-ga bucurigaku-no kenkyuu su-ru.

Again it seems reasonable to suppose that (149) and (151) share the same basic form:

(153) (John)_{NP}((bucurigaku)_{NP}((kenkyuu)_{NP}-su)_{VP})_{ru}

Sentence (149) will be obtained from this by ga/o-Insertion (131) in a straightforward way. (Note that the rule is so formulated that it will insert o after the second unmarked noun phrase.) To obtain (151), it will be assumed that a special transformation will put the object phrase into the noun phrase kenkyuu:

(154) (John)_{NP}(((bucurigaku)_{NP}-no(kenkyuu)_{NP}-si)_{V})_{VP}-ru

Ga/o-Insertion (131) will then apply to this string and will yield (151).
After the above remarks on the Sino-Japanese verb, let us turn our attention to our previous example (22), which will be repeated here as (155), and see how it will be generated within our present scheme.

(155) John-ga Bill-ni seikoo-o kitai-si-ta.

John expected success from Bill.

The basic form of this sentence will be assumed to be:

\[(156) \quad (\text{John})_{\text{NP}}(((\text{Bill})_{\text{NP}}((\text{seikoo})_{\text{NP}}-\text{su})_{\text{VP}}-\text{ru})_{\text{Comp}} -\text{koto})_{\text{NP}}(\text{kitai-si})_{\text{VP}}-\text{ta}\]

Ga/o-Insertion applied inside the Comp will insert ga after Bill. It may or may not insert o after seikoo, as remarked above. Let us assume it does not. Constituent Subject Extraction (20) will take Bill-ga out of the Comp and change it into the ni-phrase. Si-Deletion (25) will optionally delete the string su-ru-koto. We thus get

\[(157) \quad (\text{John})_{\text{NP}}((\text{Bill})_{\text{NP}}-\text{ni}(((\text{seikoo})_{\text{NP}})_{\text{VP}}-\text{ru})_{\text{Comp}})_{\text{NP}} (\text{kitai-si})_{\text{VP}}-\text{ta}\]

Ga/o-Insertion (131) will again be applied to this string to yield:

\[(158) \quad \text{John-ga Bill-ni seikoo-o kitai-si-ta.} \quad (=142)\]

If o is inserted after seikoo in the first cycle, it will be deleted by ga/o-Deletion (132) and we will arrive at the same result.

The argument in this section shows that the nature of the particles ga and o is formal rather than substantial when sentence embedding is involved. This fact is naturally brought
into comparison with the distinction between the nominative and accusative cases in English, which is also formal in nature. An important consequence of ga/o-Insertion (131) is that it ensures that the sentence always possesses a surface subject: indeed we call the ga-phrase introduced into a sentence by ga/o-Insertion (131) the surface subject. If after the surface subject is generated there still remain unmarked noun phrases in the sentence, those noun phrases will, in most cases, be made into surface objects. Let us note that the ni-phrase introduced by Constituent Subject Extraction is to be regarded as marked; that rule can be conceived of as making the constituent subject a marked noun phrase of the matrix sentence. No corresponding process is provided for the constituent object, so that it remains unmarked in the matrix sentence when ga/o-Insertion is applied to the matrix.
FOOTNOTES

1. It is a characteristic of the present-day formal style of Japanese (which is the object of our description) that every noun phrase is followed by some particle; in the classical, as well as the informal, colloquial, language, the particles \textit{ga} and \textit{o} (but not others) are often, if not always, optional.

2. It would be more exact to say that (14) and (21) are both derived from the basic representation:

\begin{quote}
John expected (Bill will buy books)\textit{g}.
\end{quote}
But what is essential for our discussion is the fact that (14) and (21) have the same basic form without a matrix object. Hence, for the sake of convenience, we may simply say that (21) is derived from (14).

3. Instead of (28) one may say:

\begin{quote}
John-wa Bill-ni Tom-ni hon-o kaw-ase-ru-koto-o yurus-\textit{i}-ta.
\end{quote}
John permitted Bill to make (get) Tom (to) buy books.

4. At this stage the particle \textit{ga} is written in the basic form (43), but actually it may not appear in the basic representation, as the discussion in this chapter will show. Thus, (43) must be revised finally as:

\begin{quote}
\text{NP (Comp-rare)\textit{V} - Tense}
\end{quote}
The same remark holds for the basic representations given below.
5However, it seems that the sentence
   John-ni-wa doicugo-ga deki-ru.

is not used.

6Kot in kowakat-ta is an infix attached to the past form
   of the adjective and has nothing to do with the suffix gar,
   which happens to appear in a phonetically similar form, gat,
   before the past marker ta.

7The forms rare and e are attached to vocalic and conson-
   antal verbs, respectively.
CHAPTER VII.  Consonant morae

1. As has often been said, Japanese is a mora-counting
language. Each utterance is a succession of more or less
equally timed fractions, called morae. Each mora is of the
form C(y)V, V, or C. We shall be primarily concerned with the
third type, the consonant morae, and the particular consonants
of which they consist.

A mora consonant may or may not be nasalized. Nonnasalized
mora consonants (or, equivalently, nonnasalized consonant morae)
cannot occur in word-final position. Thus, a nonnasalized mora
consonant is always followed by a consonant, and, moreover,
these two consonants are the same and together make a consonant
geminate.

The phonetic realization of the nasalized consonantal mora
may best be described as a nasalized continuous transition from
the preceding segment to the following one. When the following
segment is a consonant, the nasalized mora consonant has the
same point and manner of articulation as that consonant; for
example, before p, b, or m, the nasalized mora consonant is m,
but before it becomes a nasalized (and voiced) s, which we shall denote by \( \tilde{\gamma} \). If the following segment is not a (true) consonant, the nasalized consonant can be phonetically described as a nasalized vowel of varying degree of closure and point of articulation. It is probably somewhat closer and nearer-to-mid than the vowel preceding it. In word-final position, the nasalized mora consonant is again a closer and nearer-to-mid nasalized prolongation of the preceding vowel or, possibly, n with a very light closure. Disregarding minor phonetic detail accounted for in late phonetic rules, we will represent the phonetic realization of the nasalized mora consonant before a vowel or a word boundary by \( \tilde{V} \).

Let us now give some examples of consonantal morae.

(1) totta (took)
gakkoo (school)
yatto (at last)
hottodoggu (hot dog)
yonda (read, past)
tonda (flew)
kešsa (inspection)
ke\(\tilde{V}\) (sword)
onna (woman)

In Bloch's phonemic interpretation of mora consonants (Bloch 1950), nasalized mora consonants are represented by one separate phoneme, /n/, while nonnasalized mora consonants are regarded as the first member of consonant geminates. Thus the
above examples are phonemically represented as:

\[(2) /totta/, /gakkoo/, /yatto/, /hottodoggu/, /yōnda/, /tondaː/, /kensa/, /kēn/, /ōnna/\]

Hattori (1955), on the other hand, maintained that the nonnasalized mora consonants should also be represented by a separate phoneme, /q/. The above examples would then have the following phonemic representation:

\[(3) /toqta/, /gaqkoo/, /yaqto/, /hoqtodoqgu/, /yoqnda/, /tondaʔ/, /kensa/, /kēn/, /ōnna/.\]

Hattori's phonemic representation is, at this point, faithful to the traditional syllabary writing system. A nasalized consonant mora is represented by \(\mathcal{N}\), while nonnasalized consonant morae are represented by a smaller version of the letter \(\mathcal{C}\).

In sections 2 and 3 we will discuss consonantal morae in terms of generative phonology. It will be shown that purely synchronic generative consideration can lead one to consider three different solutions which are almost equally economical. Their difference lies in the formulation of a nasalization rule. In section 4 this Nasalization Rule will be discussed in historical and dialectological perspective. In section 5 it will be maintained that the traditional syllabary writing system and Hattori's phonemicization reflect a native intuition about the consonantal morae, and that this intuition should be incorporated into the theory of Japanese in some form. Although a representation essentially equivalent to (3) will never be attained as a level of representation within a purely generative scheme, it will be shown that if one of the generative solutions arrived at in
section 3 is adopted a representation essentially equivalent to (3) can be deduced not generatively but in some natural way. We will maintain that this level is not a mere theoretical fiction but something which is essential in the perception of language. It is hoped that the implications involved here will have some meaning for the general theory of language perception.

2. Generatively there are five sources for mora consonants. In this section we shall look at their phonetic forms in each of these cases.

(a) When a consonantal verb stem ending in t, n, p, m, r, or b is followed by one of the suffixes ta, te, temo, or tari, the consonant mora will result, as seen in the examples below. (We represent these four suffixes by ta, the past tense marker.)

<table>
<thead>
<tr>
<th>(4)</th>
<th>stem</th>
<th>past</th>
<th>meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>kat</td>
<td>katta</td>
<td>win</td>
<td></td>
</tr>
<tr>
<td>sin</td>
<td>sinda</td>
<td>die</td>
<td></td>
</tr>
<tr>
<td>kap</td>
<td>katta</td>
<td>buy</td>
<td></td>
</tr>
<tr>
<td>kam</td>
<td>kanda</td>
<td>chew</td>
<td></td>
</tr>
<tr>
<td>kar</td>
<td>katta</td>
<td>mow</td>
<td></td>
</tr>
<tr>
<td>tob</td>
<td>tonda</td>
<td>fly</td>
<td></td>
</tr>
</tbody>
</table>

The consonantal verb stem may also end in k, s. or g. Here, however, a consonantal mora does not obtain in the suffixed form:

<table>
<thead>
<tr>
<th>(5)</th>
<th>kak</th>
<th>kaita</th>
<th>write</th>
</tr>
</thead>
<tbody>
<tr>
<td>kas</td>
<td>kasita</td>
<td>lend</td>
<td></td>
</tr>
<tr>
<td>kag</td>
<td>kaida</td>
<td>smell</td>
<td></td>
</tr>
</tbody>
</table>
After the vocalic verb the past suffix appears as ta:

(6) kake kaketa hang
    sugi sugita pass

We shall not concern ourselves with case (5); we shall not formalize the mechanism that brings in i before t or d and deletes the stem-final k and g, since it is not directly related to our main interest here. However, the following point should be noted. The past suffix has d after the stem with g, and this is to be considered a reflex from the same process that produces d in the suffix after the verbs in (4) with n, m, and b.

(b) Certain adverbs ending in ri have a consonantal mora as their second mora:

(7) kakkiri
    bassari
    yuttari
    gennari
    suppori
    simmiri
    bofyari
    yawwari
    kongari > konjiri
    manziri > mandziri
    syombori

Let us call adverbs of this form intensified adverbs and symbolically represent them by $C_1V_1C_0C_2V_2-ri$, $C_0$ being a mora consonant. This does not mean that an intensified adverb
necessarily possesses a non-intensified form, though some actually do; for example:

(8) basari (related to bassari)

Besides this nonintensified form, we sometimes find the morpheme $C_1V_1C_2V_2$ contained in other words of more or less related meaning. Thus, we have the adverbs:

(9) hakahakhi
    basabasa
    boyaboya

Native intuition would probably relate yaawari to the adjective yawaraka ("soft"), and kongari to the verb koge ("scorch").

Not all of the intensified adverbs are related to words in which a morpheme of the form $C_1V_1C_2V_2$ actually appears. Still, it seems reasonable to assume that all intensified adverbs are generated from the underlying form $C_1V_1C_2V_2$ by a certain morphophonological process which inserts $C_0$ before $C_2$.

In (7) every consonant except $d$ and $r$ appears as $C_0$. The lack of intensified adverbs with $d$ as $C_0$ seems to be only accidental. Thus, for example, zundori can quite reasonably be considered a (phonologically) possible intensified adverb. We can also note in this connection the word mondori ("somersault"), although this is not really used as an adverb. On the other hand, we will interpret the absence of intensified adverbs with $r$ as $C_0$ as having a structural basis.

(c) A Sino-Japanese morpheme may have the form $C_1V_1C_2V_2$. $C_2$ will be $k$ or $t$, and $V_2$ i or u. When such a morpheme is
followed within a word by another morpheme with an initial obstruent (i.e. k, t, p, or s; note that p is assumed to be the underlying form of the surface h) then a nonnasalized consonantal mora may result. Appearance of a consonantal mora is partly conditioned morpho-syntactically and partly phonologically. When, for example, the second consonant of the first morpheme is k and the initial consonant of the second morpheme is t, p, or s, a consonantal mora never obtains:

(10)  gaku-tyoo  (college president)
      gaku-pu > gaku-hu  (music score)
      gaku-si  (bachelor's degree)

In other combinations of obstruents, a consonantal mora may obligatorily, optionally, or never obtain, depending on morphosyntactic contexts. It is not important for our present discussion to specify these contexts. Thus, we simply refer to them as environment k and assume that in this environment the last vowel of the first Sino-Japanese morpheme drops. Our prime concern here is how the consonant just preceding the dropped vowel will be phonetically realized. The most typical occurrences are in bi-morphemic Sino-Japanese compound words and compound verbs consisting of one Sino-Japanese morpheme and the verb si ("do"). Taking such examples, we can now see how a consonantal mora will arise:

(11)  gaku-koo  gakkoo  school
      kotu-kaku  kokkaku  frame
      ketu-tei  kettei  decision
      situ-pai  sippai  failure
      ritu-syoo  rissyoo  proof
      tatu-si-ta  tassita  reached
(d) A Sino-Japanese morpheme may end in a nasalized segment. In this position there is no opposition of different types of nasalized segments and the archiphoneme representing this nasalized segment will be denoted by N. Its exact definition in terms of feature specification will not be given just yet. The segment N of a Sino-Japanese morpheme always results in a consonantal mora, whether or not that morpheme ends a word. Examples of N in the word-final position are:

(12) keN > keV
ka-kaN > kakaV

Examples in which N appears in word-medial position are:

(13) kaN-ka > kaŋka
kaN-sa > kaśsa

These forms exemplify the productive type when N is followed by a voiceless obstruent. However, in some compounds the voiceless obstruent becomes voiced, as in:

(14) kaN-sya > kandzya (patient)
hoN-koku > hoŋŋoku (native country)

When the segment N is followed by the verb si, the initial s always becomes voiced:

(15) kaN-si-ta > kandzita (felt)
taN-si-ta > tandzita (lamented)

In some compound words (especially in compound verbs with si), Sino-Japanese morphemes ending in u or ì may also exceptionally cause the initial voiceless obstruent of the following morpheme to be voiced:

(16) syou-sin > syoodzin (devotion)
syou-si-ta > syoodzita (arose)
(e) Some morphemes contain a mora consonant internally. 
like yatto, hottodoggu, onna in (1). In the examples discussed 
in (a) - (d), it was seen that a consonantal mora before a voiced 
consonant is nasalized. This rule is violated by hottodoggu. 
However, since this violation occurs only in modern loan words, 
mainly from Indo-European languages, we will exclude such words 
from consideration when we examine the fundamental phonological 
processes involved in the consonantal morae. The remaining 
examples add no new information; they neither allow us to simplify 
or force us to complicate the rules we will formulate from the 
data in the cases that occurred previously. In particular, 
let us note that no consonantal mora obtains before r.

3. We will now set up phonological rules to account for the 
consonantal morae. Let us first discuss case (a). From the 
fact that the past morpheme appears as t after all voiceless 
consants as well as after all vocalic segments (i.e., vowels 
and r), we can assume that the underlying form of the suffix is 
[ta], and t is converted into d after a voiced nonvocalic segment. 
We will formulate this Progressive Assimilation Rule as follows:

(17) Progressive Assimilation

\[ t \rightarrow [+\text{voiced}] \quad \text{in env.} \quad [-\text{vocalic}] \quad [+\text{voiced}] \]

The full specification of the segment t on the left-hand side 
of the rule is easily seen to be uneconomical and we will come 
back to this in (26). This form will suffice in the meantime.

We see from (4) that t, p, and r become t, while b and m
become n, and n stays n, before t or d. These stem-final consonants, whether or not they become nasalized, clearly assimilate to the following t or d with regard to other features. The assimilation cannot take place unconditionally, of course; it will not apply, for example, before a vowel. As far as case (a) is concerned, it applies only before t and d. For now, we will formulate Regressive Assimilation simply as follows:

\[(18) \quad \text{Regressive Assimilation} \]
\[
\begin{align*}
[+\text{consonantal}] & \rightarrow \begin{cases}
\{\text{feature A}\} \\
\{\text{feature B}\}
\end{cases} \\
\text{in env.} & \begin{cases}
\{\text{feature A}\} \\
\{\text{feature B}\}
\end{cases}
\end{align*}
\]

Since the stem-final b is nasalized before d, some sort of nasalization rule is required. Before trying to formulate it, we will look at case (b).

In case (b), some segment is inserted after the initial mora. How should this segment be specified? It is variously realized as k, s, t, etc., but this variety clearly results in part from assimilation to the following segment. The various phonetic realizations have in common only one specification, i.e., nonvocalic. Furthermore, the segments to be assimilated can be characterized as nonvocalic. Thus, one may assume that the inserted segment is specified as nonvocalic and the other features are specified by another assimilation rule:

\[(19) \quad [-\text{vocalic}] \rightarrow \begin{cases}
\{\text{feature A}'\} \\
\{\text{feature A}'\}
\end{cases} \\
\text{in env.} \begin{cases}
\{\text{feature B}'\} \\
\{\text{feature B}'\}
\end{cases}
\]
What features A, B, ... and A', B', ... are involved in (18) and (19)? Since r is to be converted to t by (18), not only point-of-articulation features but also voicing and vocalicity should be assimilated in (18). Since the inserted segment takes consonanticity from the following segment, this must be included in (19) in addition to point-of-articulation features and voicing. Thus, if (18) and (19) are combined into one rule, the right-hand side of the rule will be:

\[(20) \quad \rightarrow \left[ \phantom{-} \text{feature A} \right] \quad \text{in env.} \quad \left[ \phantom{-} \text{feature A} \right] \]

where A ranges over all features except nasality.

With an assimilation rule of this form, there is no reason to specify the inserted segment of case (b) as nonvocalic, since this would result automatically from the assimilation rule. It is still necessary that the inserted segment be specified as distinct from vowels, to which the assimilation rule should not apply. The specification consonantal suffices for this purpose; and, moreover, the assimilation rule will convert this into nonconsonantal whenever necessary. Thus there is no extra cost in specifying the consonantal mora C₀ in case (b) as consonantal instead of nonvocalic. We can now combine the left-hand side of the two assimilation rules:

\[(21) \quad \text{Regressive Assimilation} \]

\[ [+\text{consonantal}] \rightarrow \left[ \phantom{-} \text{feature A} \right] \quad \text{in env.} \quad \left[ \phantom{-} \text{feature A} \right] \]

where A ranges over all features except nasality.
The feature nasality remains to be taken care of. But in the consonantal morae of cases (a) and (b) this can easily be predicted: the consonantal mora is nasalized if it is voiced. This can be formalized in the following rule, which, it is important to note, applies after Regressive Assimilation:

(22) Nasalization of Type 1

\[
\begin{align*}
[-\text{vocalic}] & \rightarrow [+\text{nasalized}] \quad \text{in env. \_\_\_][-\text{vocalic}] \\
[+\text{voiced}] & \quad \text{[+nasalized]} \\
\end{align*}
\]

However, it is also possible to predict nasality in the consonantal mora from voicing in the following consonant: the consonantal mora is nasalized if the following consonant is voiced. This prediction can be made either before or after Regressive Assimilation, but the left-hand side of the rule will differ slightly according to the ordering. If it is to be applied before Regressive Assimilation, the rule would have the following form:

(23) Nasalization of Type 2-a

\[
\begin{align*}
[+\text{consonantal}] & \rightarrow [+\text{nasalized}] \quad \text{in env. \_\_\_\_}[+\text{voiced}] \\
[+\text{voiced}] & \quad \text{[+nasalized]} \\
\end{align*}
\]

If applicable after Regressive Assimilation, the form would be:

(24) Nasalization of Type 2-b

\[
\begin{align*}
[-\text{vocalic}] & \rightarrow [+\text{nasalized}] \quad \text{in env. \_\_\_\_}[+\text{voiced}] \\
[-\text{vocalic}] & \quad \text{[+nasalized]} \\
\end{align*}
\]

In terms of number of feature specifications, these three rules are equally economical. Thus the principle of economy will not tell us which to choose.

Next let us look at case (c). Here, when consonant clusters result from the dropping of the final vowel of certain Sino-Japanese morphemes in the environment E, the first voice-
less stop of the cluster is then assimilated to the following consonant. No further consideration need be given to this assimilation.

In case (d), when N is found in word-final position as in (12), the manner and point of articulation are determined by the preceding vowel. This assimilation to the preceding vowel is probably not complete, as noted in section 1, but we can formulate it simply as follows:

\[(25)\]
\[
\text{Vocalic Assimilation} \quad [+\text{consonantal}] \rightarrow [\alpha \text{feature A}]
\]
\[
in_{\text{env.}} [\alpha \text{feature A}] \quad \#
\]
where A ranges over all features except nasality

In any event, this rule is not relevant to our main discussion and can be disregarded here.

When N is followed by a consonant, that consonant is sometimes voiced and sometimes not. (See (13) and (14).) This can be accounted for by assuming that in some cases Progressive Assimilation applies in case (d):

\[(26)\]
\[
\text{Progressive Assimilation} \quad [+\text{consonantal}] \rightarrow [+\text{voiced}] \quad \text{in}_{\text{env.}} \quad [-\text{vocalic}] \quad [+\text{voiced}]
\]
The manner and point of articulation of N are then determined by Regressive Assimilation. However, if Progressive Assimilation has not applied, the application of Regressive Assimilation will make N voiceless (e.g., kaN-sa > ka$s$a). We must then either prevent the application of Regressive Assimilation in this case (i.e., where Progressive Assimilation has not applied), or introduce the following rule to adjust voicing:
(7) Voicing Adjustment

\[ [+\text{nasalized}] \rightarrow [+\text{voiced}] \]

Whatever choice is made for the Nasalization Rule, Voicing Adjustment can be the last of our rules. The matter of whether the adjustment of voicing in case (13) is made by an additional restraint on Regressive Assimilation or by an additional rule of Voicing Adjustment is not essential to the discussion that follows.

We can now define \( N \) as the segment \([+\text{consonantal}, +\text{nasalized}]\). On the other hand, the segment to be inserted in the intensified adverb, which we denote by \( Q \), is specified as \([+\text{consonantal}, -\text{nasalized}, -\text{voiced}]\).

We have at this point three uncomparable phonological systems that will account for the facts given. Each is composed of three rules to be applied in the order shown:

(28) Phonological System I

Progressive Assimilation
Regressive Assimilation
Nasalization of Type 1

(29) Phonological System II

Progressive Assimilation
Nasalization of Type 2.a
Regressive Assimilation

(30) Phonological System III

Progressive Assimilation
Regressive Assimilation
Nasalization of Type 2,b
4. In the preceding section it was stated that three different phonological systems could account for the consonantal morae. Here we will consider the problem in a historical and comparative framework.

It is generally believed that in old Japanese of about the eighth century, all morae were open. In the oldest records of the language, written in Chinese characters used logographically in part and syllabically in part, no trace has been found of the consonantal morae. At that time the stem-final consonant never directly preceded the suffix but was followed by an intervening vowel. Accordingly, the consonantal morae of case (a) could not exist. Adverbs of case (b) are, and probably always have been, somewhat colloquial, and even they did exist in the earlier language they would probably not have been recorded. Thus, it cannot be definitely stated that intensified adverbs were not present in old Japanese. We shall, however, assume that they did not exist in the earliest stage. Since Chinese characters were used to record a language of an entirely different phonetic structure, it can be seen that Chinese influence on Japanese was already strong at that time; but the number of Chinese morphemes found in old Japanese literature is relatively small. Therefore we shall say that consonantal morae of types (c) and (d) did not exist then, at least in any productive sense.

From middle Japanese of about the tenth century on, verb forms with consonantal morae (the so-called onbin-kei) similar to those in (4) gradually came into existence, and, furthermore,
Sino-Japanese words began occupying a larger and larger part of the ordinary vocabulary of the Japanese language. Thus, the consonantal morae of cases (a) to (d) were introduced and left their traces in the records written in the syllabary system that was invented early in the middle Japanese period.

The Nasalization Rules seem somewhat different from the others in that their phonological nature is not directly obvious. This is strengthened by the nonuniqueness of the generative interpretation of the nasalization process. The fact underlying the rule can be expressed on the phonetic level by saying that before a voiced consonant (or, more exactly, before a nonvocalic segment), only a nasalized consonant can appear. But generatively this consonant nasalization can equally be predicted from either its own voicing or that of the following consonant, depending on the relative order of Nasalization and Regressive Assimilation.

Let us now look at the Nasalization Rule in a historical and comparative perspective. In some present dialects of peripheral areas, and even in the Kyoto dialect of an earlier time, the vowel is nasalized before some voiced consonants. Thus, in the Tohoku and Tosa dialects, spoken respectively, in the northern part of the main island and in the southern part of Sikoku island, the vowel is nasalized before a voiced obstruent. Furthermore, a Portuguese priest, Rodriguez, who recorded standard early seventeenth century Japanese (Kyoto dialect), noted similar nasalization of the vowel. (Kokugo-gakkai (1955)).
The rule to account for this nasalization of vowels would be:

\[(31) \quad \text{[vowel]} \rightarrow \text{[+nasalized] in env. [+consonantal] in [-vocalic, +voiced]}\]

That is, before a voiced real consonant (thus excluding \(r\) and \(y\)), every segment will be nasalized.

If every mora is open, every consonant is preceded by a vowel, and it follows that only the vowel can be affected by rule (31). But this same rule will account for nasalization of the consonant in onbin forms like (4), when they are introduced into the language, or, equivalently and more specifically, for nasalization of the stem-final \(b\) before the consonant \(d\). In other words, given rule (31) in the grammar, nasalization of the stem-final \(b\) was simply an automatic consequence of the formation of consonant clusters.

However, the nasalization of \(y\) and \(w\) in case (b) cannot be accounted for in this way since they are not consonantal. It is not clear when adverbs like boyyari and yawwari were introduced. The latter type probably did not exist in the very early language since the word-medial \(w\) in modern Japanese is generally a reflex of middle or old Japanese \(p\). It is possible that the former, however, was present quite early. We will discuss nasalization of these glides in two cases.

First let us assume that the nasalized glides were introduced before the vowel lost its nasalization before voiced real consonants. In this case it is supposed that when the nasalized glides were introduced nasalization rule (31) was modified in the following way:
where the following convention about the use of brackets <  and <<  is assumed: the rule consists of two subrules, the one obtained by reading and not reading the contents of <  and <<  , respectively, and the other by not reading and reading the contents of <  and <<  , respectively. Thus, rule (32) means that the vowel can be nasalized only before a real consonant, but the glide or real consonant can be nasalized before glides as well as before real consonants. Formally speaking, this innovation is a specialization of rule (31). Then afterward, when the vowel lost its nasality before a voiced obstruent, application of (32) was limited to consonants. This restriction is realized by replacing the contents of the brackets on the left-hand side of the rule with either +consonantal or -vocalic. Then a conditional restriction in the environment <<+consonantal>> becomes meaningless, and the revised rule will have the form:

\[(33) \quad [+\text{consonantal}] \rightarrow [+\text{nasalized}]\quad \text{in env.} \quad[-\text{vocalic}]+\text{voiced}\]

or

\[(34) \quad [-\text{vocalic}] \rightarrow [+\text{nasalized}]\quad \text{in env.} \quad[-\text{vocalic}]+\text{voiced}\]

But these rules are Nasalization Rules of Type 2.a and 2.b, respectively.

Now let us assume that the nasalized glide was introduced after the vowel lost its nasality before voiced consonants. Then, when the vowel lost its nasality rule (31) may have been revised as follows:
However, from our assumption that at this moment glides did not play a part in consonant cluster formation, replacement of \(-\text{vocalic}\) in (35) by \(\text{consonantal}\) (independently for the two occurrences) will yield another three equivalent rules:

(36) \([-\text{vocalic}] \rightarrow [+\text{nasalized}] \text{ in env.} \quad \text{[+consonantal] [+voiced]}\)

(37) \([+\text{consonantal}] \rightarrow [+\text{nasalized}] \text{ in env.} \quad [-\text{vocalic}] \quad [+\text{voiced}]\)

(38) \([+\text{consonantal}] \rightarrow [+\text{nasalized}] \text{ in env.} \quad [+\text{consonantal}] \quad [+\text{voiced}]\)

Until the glide cluster is introduced, these four rules account for the facts equivalently. Only (35) and (37) can meet the new situation with the glide cluster, and these two rules are Nasalization Rules of Type 2.a and 2.b, respectively.

In the preceding section we arrived at three equivalent phonological systems. The above historical discussion shows that Nasalization Rule of Type 2.a and 2.b can be understood as a descendant of the nasalization rule that presumably existed in old Japanese. On the other hand, if Nasalization Rule of Type 1 is a rule in the grammar of present Japanese, it means that a discontinuous reformulation of a section of the phonological component occurred in some generation. It is possible, but not very probable, that if we try to incorporate the phonological systems we obtained above into a larger section of the phonological component of Japanese, one of them will turn out to be preferred. Or our understanding of the evaluation procedure of grammars may advance so that a particular type of ordering or rules may be deemed preferable. At present, however,
we cannot choose one system out of the three solely on the principle of economy. Consequently, we are not in a position to determine by generative arguments whether a discontinuous reformulation has taken place concerning nasalization. In the next section, however, we will present an argument that will assign some preference to phonological system II. Since our argument will refer to the perceptual mechanism, it will not be strictly generative but will remain synchronic.

5. As mentioned previously, the Japanese syllabary writing system consistently represents the nasalized and nonnasalized consonantal morae by the same symbols, ｒ and ｆ, respectively, and so does Hattori's phonemicization, by ｎ and ｇ, respectively, (See-(3).) It seems beyond doubt that the native intuition identifies the nasalized mora and the nonnasalized consonantal mora as definite entities. This identification consonantal mora is possible and natural, since for the speaker of Japanese the mora is definitely an independent phonological entity. Given an utterance, the speaker can divide it into morae; then, for any two of those morae, he can tell whether or not they are identical. Morae which do not contain any vowel are grouped into only two classes, nasalized or nonnasalized.

Neither the nasalized nor nonnasalized consonantal mora is identified on any generative level of representation, however, in the sense that it appears as an identical segment. In the phonetic representation, the consonantal mora appears variously as a sound assimilated to the following consonant. In the
underlying representation the segment to become a consonantal mora takes various forms depending on its source. The nasalized mora consonant appears as N in Sino-Japanese morphemes as in (12) - (14), but it appears as b in tob-ta (cf. (4)) and as Q in the underlying representations of intensified adverbs, such as gennari, simmiri, boyyari, yawwari, kongari, manziri, and syombori in (7). The nonnasalized mora consonant appears as Q in the underlying forms of kakkiri, bassari, yuttari, suppori in (7), but as t, p, r, in kat-ta, kap-ta, kar-ta in (4) and as k or t in certain Sino-Japanese morphemes as in (11). Furthermore, it can be seen that whichever of the phonological systems I, II, and III is chosen, there can be no intermediate level of representation in which the identification of nasalized or nonnasalized consonantal morae is realized.

It is possible, to be sure, to have a procedure, given the phonetic representation, that will characterize the nasalized or nonnasalized morae by some means. For example, we can say that consonantal segment is by definition a nonnasalized mora segment if it is nonnasalized and directly followed by a consonantal segment. However, this characterization is completely ad hoc. Indeed, we may as well define, say, stop mora segment as a noncontinuant consonantal segment directly followed by a consonantal segment. But the fact remains that the native speaker identifies the former kind of segment as one entity but not the latter.

The characterizations given above do not refer to any generative phonological concept. That is, they are propositions
completely independent from the theoretical scheme of generative phonology. Thus, if the above characterization of the nonnasalized mora consonant should be the correct one to explain the native intuition about the nonnasalized mora consonant, either one of the following might be said: (i) The native identification of the non-nasalized mora consonant is linguistically an arbitrary phenomenon, probably due to some convention outside the realm of linguistics. It could be the case that the native speaker identifies the stop mora consonant, as defined above, by some other convention. Accordingly the notion of nonnasalized consonantal mora is linguistically insignificant. (ii) There may be some linguistically relevant factors explaining the ability of the speaker to identify the non-nasalized consonantal mora but not the stop consonantal mora, but these are completely out of the theoretical scheme of generative phonology. Accordingly, viewed solely from the generative phonological standpoint, the native identification of the nonnasalized consonantal mora is as arbitrary as the possible identification of the stop consonantal mora. (In the above statements, one may of course replace nonnasalized consonantal mora by nasalized consonantal mora.)

However, one may hesitate to say that generative phonology embraces so restricted an area of the sound phase of language that as fundamental a problem as consonantal mora can exist totally outside that area, or, alternatively, that the identification of the consonantal mora is so marginal a problem that generative phonology has nothing to do with it. Thus worth investigating whether the native intuition about the
consantal mora has many significance for the generative structure of phonology, and whether there is any justification, from the generative point of view, for a transcription like Hattori's which explicitly reflects this intuition.\textsuperscript{5}

We know that there is no generative level that represents the H representation, and it seems that we cannot decide by a generative method what segments \( n \) and \( q \) stand for. However, the intuitive identification of various occurrences of \( n \) and \( q \) may have to be considered as a phenomenon belonging to the perceptual sphere of language behavior. Is there any justification for considering that the phonemic representation is significantly involved in perceptual behavior?

Phonetic representation represents in some sense the physical form of the sentence. The direct input to the perceptual organ is the same physical sound as the output of speech activity. In this sense the phonetic representation is the input for the perceptual activity. However, it seems that one can still ask whether this is to be considered a significant input to the perceptual analytic mechanism. It has been proposed that when an input is received, an analysis by synthesis tries to generate the sentence that matches the input. Let us call the input for perception the representation which is temporarily stored by the perceptual mechanism during this analytic procedure. It may be possible that this input for perception is different from the direct physical input. That is, the perceptual mechanism may preliminarily process the direct physical input.
Let us take an example. In English voiceless stops are aspirated in some positions. But distinction of aspirated and nonaspirated stops is the result of a very late phonetic rule, and in the dictionary forms there is no corresponding opposition. Since aspiration is a universal phonetic feature, the auditory organ of the native English speaker, like that of any human being, can react to it. However, his built-in perceptual mechanism does not generally react to aspiration. One may explain this by saying that the native speaker knows that the feature of aspiration is not relevant to the underlying forms and that it is brought in by a very late rule. This explanation seems to be reasonable, though formally it is not clearly stated. Then, we may speculate as follows.

For the procedure of analysis by synthesis to take place, it is not necessary for the synthesis part to generate the exact phonetic representation. For matching purposes, the specification of aspiration, for example, is entirely redundant. Hence the synthesis part of the analysis may finish its generative processes some time before the rule to assign aspiration is reached. It is also not necessary to record and store the specification of aspiration contained in the direct phonetic input. Thus, the perceptive mechanism may pre-process the direct input to store it, during the analysis by synthesis procedure, in a more economical form.\(^6\)

The above example from English is brought in simply for illustrative purposes. What we are interested in here is seeing whether some explanation within the generative framework can be given for the symbols \(n\) and \(\mathbf{q}\) in Hattori's phonemicization. But let us pursue our problem a bit further in general terms.
Let us assume that analysis by synthesis stops its generative operations at each trial at the level of rule R, that is, just after application of rule R, and matches the generated string with the stored input. We are now asking what a reasonable form would be for the input for perception under this assumption. It seems natural to impose the following condition on the stored input for perception of a sentence: it is nondistinct from the generative representation of that sentence at the level of rule R, and, if all the rules after rule R are applied to it, the phonetic representation of the sentence will be obtained (or, one may say, restored). In other words, it is assumed that the input of perception at the level of rule R, is an inverse, in a natural sense, of the phonetic representation of the given sentence. This condition ensures for analysis by synthesis the natural procedure of judging whether a synthesized sentence is identical with the perceived sentence.

However, an inverse of the phonetic representation at the level of rule R in the sense defined above is not determined uniquely, and in general a string which is not distinguished from the phonetic representation in an interesting way can be such an inverse. Indeed, if R is a late enough rule, the phonetic representation itself can be an inverse at the level of R. (For example, it is quite probable that if we reapply rules later than the one which assigns aspiration in English to the phonetic representation, it will remain unchanged and is an inverse of itself, at the level of the aspiration rule.)
Thus, let us further introduce a minimality condition and assume that the input for perception is a minimally specified inverse at the level of rule R.

It now becomes clear that if we adopt phonological system II, H representation can be interpreted as the input for perception at the level of Nasalization by understanding that $n$ and $q$ stand for segments $N_o$ and $Q_o$, where $N_o = [+\text{consonantal}]$ and $Q_o = [-\text{nasal}]$. Indeed, at the level of Nasalization, all relevant specifications for a segment that will turn out to be a mora consonant are specifications of consonanticity and nasality. If features other than nasality are left blank, they will be specified by Regressive Assimilation; but specification of consonanticity is needed because it is referred to on the left-hand side of Regressive Assimilation. Actually this representation is uniquely determined as a minimally specified inverse of the phonetic representation at the level of Nasalization.

In the phonological systems I and III, H representation cannot be formally characterized in this way. First, an inverse of the phonetic representation at the level of Regressive Assimilation or a later level cannot have the same symbol standing for the nasalized (or nonnasalized) mora consonant. For if Regressive Assimilation is not applied any more, the manner and point of articulation should be specified in the segment representing a consonantal mora in any inverse, differently depending on the context of the segment (for example, before grave consonant, grave, etc.) Secondly, at the level of Progressive Assimilation,
H representation cannot in general be nondistinct from the
generative representation. Take, for instance, the words **tonda**
in (4) and **boyyari** in (7). Their H representations are **tonda**
and **bonvari**, and their generative representations at the level
of Progressive Assimilation are **tob-da** and **boQyari**, respectively.
But **b** and **n** (with the understanding that **n** stands for the
segment **N**), or **Q** and **n** are distinct.

The above discussion does not seem to be a simple manipula-
tion of formalism. Rather, the fact that H representation,
which is securely supported by the native intuition, is
characterized within the conceptual scheme of generative phonology
seems to be worth noting. This shows, first, that generative
theory, keeping its rigorous formalism, can give interpretation
to certain facts about speech sounds which are beyond the
strictly generative sphere. Furthermore, if the interpretation
of H representation by means of generative phonology should be
significant, phonological system II has now acquired superiority
over phonological systems I and III by a strictly synchronic
argument.

If one accepts the above interpretation of H representation,
a meaningful line is drawn between Nasalization and Regressive
Assimilation in the ordered set of phonological rules of system
II. This level does not give any interesting generative re-
presentation but it characterizes the input for perception as
the minimally specified inverse of the phonetic representation.

At this moment we do not claim to have any general theoretic
conclusion to draw from our investigation. We do not know
whether there is a significant level of perception above the phonetic level for every language. We do not know whether and how the perceptual level, if it exists, can be internally characterized within the generative phonological scheme. Thus, we cannot explain in general terms why phonological system II is adopted by the native speaker out of three generatively equivalent systems and why the level of perception is found between Nasalization and Regressive Assimilation (of course it may not be difficult to give some ad hoc explanation for this special case), and accordingly why H representation, and not possibly some other form of representation, obtains special status in the native intuition. What we have intended to do, given the fact that H representation is significant in the native intuition, is try to interpret this fact within the present framework of generative phonology, and since a natural interpretation can be given by system II, but not by the others, we conclude that system II is the most probable one adopted by the native speaker.
FOOTNOTES

1 The preceding segment is necessarily a vowel.

2 For a generative treatment of this mechanism, see McCawley (1965).

3 Well-known later phonetic rules will change medial g to 珺 and z to dz. For a more precise description, see McCawley (1965).

4 The first attempt to account for all phonetic forms of consonantal morae in a systematic and significant way is found in McCawley (1965). It is particularly important to note that the nasalization found in case (a) is related to that in case (b). Only by recognizing this relationship can the real significance of the alternation _b - n_ in the verb be revealed. However, in our later discussion we will present a formulation of the nasalization rule that is different from that given by McCawley.

5 We shall use the term _H representation_ to refer to the representation in Hattori's phonemicization, as in (3).

6 We assumed in the above argument that aspiration was not a cue in the perception of stops in English in any context. But the redundancy in perception in this sense does not follow immediately from the fact that a feature is redundant in the underlying representations. It is reported, for instance, that the cue in the perception of the contrast between voiced and voiceless consonants in certain intervocalic positions in English is _length of closure_ (or _length of silence_), e.g., _rupee_ vs. _ruby_.

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Thus, the pre-processing of the perceptual mechanism may involve more than just disregarding certain features sensed by the auditory organ; there may have to be conversion of some features sensed by the auditory organ, in some contexts, into others in the built-in perceptual mechanism. For the purpose of our following discussion, however, it is sufficient to assume the simplest disregarding case.
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He published:

Gengo no Kizyutu, Tokyo, 1960.

