REMARKS ON THE NOTION OF SUBJECT WITH REFERENCE TO WORDS LIKE ALSO, EVEN, OR ONLY, Illustrating Certain Manners in Which Formal Systems Are Employed as Auxiliary Devices in Linguistic Descriptions

Part 1

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As is well known it is G. Frege's merit that mathematical logic disposed of the notions of subject and predicate, on which the traditional logic was founded. To quote from Kneale and Kneale [1962]:

> "According to most earlier logicians there could be no adequate representation of a judgment without a distinction between subject and predicate, but Frege rejects this dogma. There may indeed be a rhetorical difference between 'The Greeks defeated the Persians' and 'The Persians were defeated by the Greeks'; but the conceptual content of the two statements is the same, because either can be substituted for the other as a premise without effect on the validity of our reasoning, and this is all we need consider when we try to make a language for the purpose he has in mind." (p. 479)

Perhaps this aspect of the development of logic from the traditional to the modern would concern the linguist most, because the notions of subject and predicate are also fundamental in traditional grammar.[1] So long as the traditional logic was believed to represent the undoubted truth the subject and the predicate in grammar might well be assumed to have a secured basis.[2] Once their logical basis has evaporated, the subject and the predicate as grammatical notions may seem to be groundless.

According to the traditional logic a judgment is assumed to say something (the property expressed by the predicate) of something else (the entity denoted by the subject). According to the modern logic a state of affairs (or whatever one may call that which is the content of a statement) does not necessarily have to be described in such a way that it consists of an entity (the subject) that carries some property (the predicate). True, a logical system, just as powerful as the ordinary

system for predicate calculus, may be constructed which contains, or even is solely made up of, formulas that are intented to be interpreted as representing statements of the subject-predicate structure. For example, one may introduce a kind of "higher predicate" S(,), where the first place is to be filled with a variable or constant and the second place with a usual type of predicate formula one of whose places is, however, left blank; for example, S(a, P(—, b)) is a well-formed formula in the proposed system and is intended to be interpreted as "a is a subject of the property which says that between it and b the relation P holds." A system like this would be a plausible one to formalize the traditional notion of subject and in fact suggestions along this line to construct a formal system that incorporates the subject-predicate paradigm are not altogether lacking. But, while such an attempt would indeed furnish the subject-predicate paradigm with a system of formal representations, it does not give any logical justification for its existence. It should be clear that from the purely logical point of view introduction of formulas like S(a, P(—, b)) has no effect other than to complicate the system of axioms and rules of inference, and is only superfluous.

One may well wonder, then, whether the concepts of subject and predicate are mere fictions in grammar as well as in logic. The question as to whether or not the subject-predicate paradigm is psychologically and grammatically real is a question to be asked seriously, once its logical reality has been shown to be specious.

The historical fact that the subject-predicate paradigm had been taken for granted by logicians, philosophers, and grammarians for so long until Frege challenged its logical reality might be taken to be some indication that it has some psychological reality. But such an indication would not give any insight into the question as to why the subject-predicate paradigm exists in human language and what semantic rôle it performs.

However, to evidence existence of the subject-predicate paradigm without directly appealing to native intuition is a hard thing to do. One may say that the Greeks is the subject of the Greeks defeated the Persians and the Persians is the subject of the Persians were defeated by the Greeks. But how can one justify this claim? One could appeal to native intuition by

saying that the speaker feels the first sentence is about the Greeks and the second, about the Persians. Validity of this kind of justification may not be rejected altogether; after all linguistics would ultimately have to be founded on native intuition in certain respects. But if the linguist is satisfied only with such directly intuitive indication for support of the subject-predicate paradigm the phenomenon is left simply as an isolated fact and no interesting linguistic description can be said to have been obtained about it.

In this paper I shall discuss some aspects of the subject-predicate paradigm referring to Japanese, although the significance of the discussion is believed to extend well beyond the bounds of an exotic tongue.
As a starting point of my discussion I shall assume that certain constructions in Japanese represent the subject-predicate paradigm. This judgment I shall base on native intuition and it is not my present concern to try to justify it. For my present purpose it suffices to admit that the subject-predicate paradigm exists in the language and then I shall try to relate it to another phenomenon of language, the fact that it utilizes words like mo (also), sae (even), or dake (only). I shall try to show, in a way relatively formal, less dependent on native intuition, that the subject-predicate paradigm is exploited, in a certain logical sense, in a nonsuperfluous way. This argument would supply relative justification for the existence of the subject-predicate paradigm in language, not a kind expected to be obtained by observation from the viewpoint of formal logic in the usual sense, yet formalized enough to crystalize certain effects of the semantic rôle of the subject-predicate paradigm outside native intuition. The justification is relative in the sense that it reduces the problem of justification for the existence of the subject-predicate paradigm to the fact that such words as also, even, and only exist in language, whose existence may in turn be qualified as logically superfluous but is certainly unquestionable.

But I do not intend to claim that the subject-predicate paradigm has come into existence in human language for the sole reason that it serves the role which I shall discuss in what follows in connection with words like also, even, or only. The essential and ultimate account of the existence of the subject-predicate paradigm must still be looked for. The purpose of this paper is simply to uncover a "trace" of the subject-predicate paradigm

that can be seen without direct appeal to native intuition.

As I mentioned earlier I believe that an argument parallel to the one I shall make concerning Japanese can be developed for English or other languages familiar. The same kind of relative justification of the subject-predicate paradigm would be obtained as a universal fact of language, universal to the extent that the traditional belief in the subject-predicate paradigm was taken to be universal. It might be suggested that I should rather take up English, so far the most popular language among linguistic theoreticians, to discuss the problem in a form more easily accessible to a wider audience. But two considerations led me to abandon that idea. First, although the essentials of the phenomena that will be discussed here are, once uncovered, quite simple, they are intermingled with surface complexities in a subtle way in English as well as in Japanese. For example, the position of a word like also, even, or only in a surface structure can be a matter of quite delicate taste. A mistake or carelessness in such matters on the part of the author whose mother tongue is not English, inessential though they may be, may cause unexpected difficulties in understanding the essential points of the arguments on the part of any reader who is native in English and a credibility gap may arise. Secondly, both in English and in Japanese there is no simple surface configuration (e. g. , as the simplest possibility, an overt marker) that can be assumed to characterize, always and unmistakably, the subject-predicate paradigm, or the subject of a sentence. Yet the situation is considerably better in Japanese. As I stated earlier I assume that certain constructions represent subject-predicate statements. But by this I do not mean to assume, as the traditionalist would do, that all sentences comply to the subject-predicate paradigm. Excluding imperatives, optatives, and those others which even the traditional grammarian might have excluded from the subject-predicate paradigm and restricting oneself only to most typical declarative, assertive sentences, still one must maintain that such sentences are either subjectless or of the subject-predicate structure. But in English this distrinction is hardly recognizable syntactically. In Japanese the situation is better, though not completely straightforward.

Whether subjectless sentences exist or not is an issue that was once

discussed extensively, in particular in the latter half of the last century. I believe that the range of subjectless sentences must be assumed to be much wider and its status much more general and important than the traditional proponents of subjectless sentences seem to have acknowledged. To give even a fragmentary account of the distinction of subjectless sentences and sentences of the subject-predicate structure, however, is not my concern in this paper. Ironically, we are now concerned rather with the question as to whether the subject-predicate paradigm is a grammatical reality, not with the question as to whether the subjectless structure is.

After these preliminary general remarks I am now going to discuss the main topic. It will be assumed that the subject of a sentence is indicated by wa in Japanese. Compare the following two sentences:

(1) John ga hon o yonde iru.

(2) John wa hon o yonde iru.

Both of these sentences could be translated as John is reading a book. But (2) is assumed to have the subject-predicate structure, and John to be the subject of the sentence, while (1) is assumed to be devoid of that structure; (2) represents a statement 'about' John, (1) represents a statement referring to a state of affairs directly without making any of its constituent entities (neither John nor the book) an underlying carrier (subject) of a certain property (predicate).

As I said earlier it is not the main objective of this paper to discuss and justify this assumption concerning the distinction of subjectless sentences and sentences of the subject-predicate structure in the sense intended here. [3] But a remark or two about it may be in order.

First, the statement "the subject of a sentence is indicated by wa" is, taken as a statement about surface structures, an oversimplification, though it can perhaps be assumed to be the correct first step of generalization. On the one hand, a surface constituent that is to be assumed to represent the subject of a sentence may not be accompanied by wa in the surface structure for a variety of reasons. In the course of the following discussion I shall have to mention some cases in which the subject marker wa is deleted from surface structures. On the other hand, the semantic rôle of wa is not restricted to the subject marker; noun phrases accompanied by wa may not

necessarily be interpreted as the subjects of sentences that contain them. It is a well-known fact in Japanese linguistics that wa is distributionally similar to words such as mo, sae, and dake; with them it is sometimes called "huku-zyosi" (perhaps intended to be translated "adverbial particle"). I would assume that the semantic rôle, or the meaning, of wa as the subject marker is essentially related to the general meaning of wa as huku-zyosi. I shall return to this question later (cf. Part II).

Secondly, it was indicated that the English sentence John is reading a book can translate both (1) and (2). I would assume that this English sentence is ambiguous in this intended sense, i. e. , it represents either a subjectless statement or a statement of the subject-predicate structure. Just in what sense one must interpret the word "ambiguous" here in a formalized grammar of English is a serious and not simple question; I shall leave it for future study. Insomuch as most English sentences can be translated in Japanese either by subjectless sentences or by sentences of the subject-predicate structure, they must be assumed to be ambiguous in this sense. But not all English sentences. Take, for example, the sentence:

(3) A child is reading a book there.

A Japanese translation of this sentence would be given by:

(4) Kodomo ga asoko de hon o yonde iru.

If one replaces ga in (4) by wa, one obtains another sentence:

(5) Kodomo wa asoko de hon o yonde iru.

But this sentence would not translate (3). It can be translation of

(6) The child is reading a book there.

and so can (4), although without contexts sentences like

(7) Sono kodomo ga asoko de hon o yonde iru.

and

(8) Sono kodomo wa asoko de hon o yonde iru.

would be taken to be better translations of (6) than (4) and (5) from the practical or heuristic point of view. Irrelevant details and complications put aside, the point here is that (3), in which the subject in the "usual" sense a "specific indefinite" noun, a child, an indefinite noun that is interpreted as denoting a specific refrrent, is unambiguously subjectless, in the sense intended here, while (6), in which the definite noun the child replaces the

indefinite noun a child of (3), is ambiguous in the sense we are concerned with.[4] Facts like this would give us enough hints of difficulties we must face if we try to characterize formally, and to give internal evidence for, the subjectless and the subject-predicate structures in English.

So much for digression. With this background I shall now maintain that certain words in Japanese like mo (also), sae (even), or dake (only) possess a particular semantic property that would reveal an aspect of the syntactico-semantic rôle of the subject.

To begin with let us assume, as formal logicians would do, that in appropriate descriptive systems based on formal logic a logical predicate corresponds to a verb and that a sentence can be represented by a logical predicate formula with a certain number of constants and variables that fill the places of the predicate. For example, if Y is a predicate corresponding to verb yonda (read, past tense),[5] the sentence:

(9) John wa Syntactic Structures[6] o yonda.
(John read Syntactic Structures.)

would be rendered as:

(10) Y(John, S. S.).

This representation ignores the "rhetoric" effect of the subject-predicate structure that is assumed to exist in (9). One might introduce a higher predicate S in such a way that

(11) S(John, Y(——, S. S.))

is assumed to represent, in addition to the information that John and S. S. fill the first and the second place of predicate Y, the fact that John is the subject of a statement, that is, the fact that John is considered to be a possessor of the property "having read S. S." However, introduction of such formulas as (11) would, as noted earlier, be scarcely justifiable logically, since (11) would simply be logically equivalent to (10). Yet, we shall see later that the existence of formulas like (11) may not be considered to be superfluous in certain types of formal systems and, in fact, in a system which is considered to reflect the syntactic structure of Japanese (or, more generally, perhaps, of human language) more faithfully than the ordinary system of formal logic does at least in regard to the aspect with which we are concerned. To accomplish this is the main objective of this paper, but

for the time being (10) is taken to represent the meaning of (9), (11) being dismissed as logically superfluous.

Alongside (9) one has:

(12) S. S. wa John ga yonda.

In this sentence the subject is S. S. The difference between (9) and (12) might be said to be "rhetoric," as the difference between the active and the passive cited in the quotation from Kneale and Kneale given earlier. Then, insomuch as (10) is considered to represent the meaning of (9), it would also be considered to represent the meaning of (12), the "rhetorical" difference being dismissed as logically superfluous.

Further, there exists also the sentence:

(13) John ga S. S. o yonda.

which does not contain wa.[7] Sentences like this are, as stated earlier, maintained to be subjectless. If (11) were taken to be a more appropriate formal representation of (9) than (10), (10) would be assigned uniquely to (13). But so long as (11) is considered to be logically unjustified, (10) would be assumed to represent both (9) and (13), the semantic difference between (9) and (13) being again regarded as simply "rhetorical."

I shall now try to represent words like mo, sae, or dake in the formal system that is to represent sentences of Japanese. Let us first consider:

(14) John wa S. S. dake o yonda.

(John read only S. S.)

This sentence presupposes that there were some books other than S. S. that John might have read but in fact did not. In case the group of books involved in the presupposition of (14) in this way is made distinct linguistically or extralinguistically, (14) may be paraphrased by a conjunction of (9) with a certain number of negative sentences, for example,

(15) John wa kore o yomanakatta;

John wa are o yomanakatta;

(sikasi) John wa S. S. o yonda.

Correspondingly, one may represent (14) formally by a conjunction of formulas like:

(16) $Y(\text{John}, \text{S. S.}) \cdot \sim Y(\text{John}, \text{kore}) \cdot \sim Y(\text{John}, \text{are})$.

In general, one may introduce a formula:

(17) $Y(\text{John}, \text{S. S.}) \cdot (\forall x)[(x = \text{S. S.}) \Rightarrow \sim Y(\text{John}, x)]$,

where x is assumed to range over an appropriate, more or less distinctly defined group of books, and may assume that (17) represents the semantic content of (14).

At this point I shall introduce a formal device that will represent a departure from the ordinary formalism of formal logic but that will make it possible for us to construct a formal system which is more "homologous" to the syntactic structure of natural language. A quantifier-like element $\mathcal{d}$ will be introduced by the following defining formula:[8)]

(18) $P(a, \mathcal{d}b) \equiv P(a,b) \cdot (\forall x)[(x \neq b) \Rightarrow \sim P(a,x)]$.

(14) can now be represented by:

(19) $Y(\text{John}, \mathcal{d}\,\text{S. S.})$

Note that, unlike the ordinary logical quantifiers, $\mathcal{d}$ "binds" a logical constant and, besides, it is attached directly to an occurrence of a constant inside a predicate. The quantifier-like $\mathcal{d}$ may be introduced into any place of a predicate with an arbitrary number of places in an obvious way. The intended syntactic analogy of $\mathcal{d}$ and dake would be evident.

In similar ways the quantifier-like μ and σ corresponding to mo and sae will be introduced. One could define μ and σ as follows:

(20) $P(a, \mu b) \equiv P(a, b) \cdot (\exists x)[(x \neq b) \cdot P(a, b)]$,

(21) $P(a, \sigma b) \equiv P(a, b) \cdot (\exists x)[(x \neq b) \cdot P(a, b)] \ldots$,

where x is assumed to range over an appropriate domain and in (21)... is assumed to represent a predicate of higher order which states that realization of the state of affairs corresponding to $P(a, b)$ is the least expected among realizations of states of affairs $P(a, x)$'s, x ranging over the intended domain.[9)] Sentences:

(22) John wa S. S. o mo yonda.
(John read also S. S.)

(23) John wa S. S. o sae yonda.[10)]
(John read even S. S.)

may be rendered as:

(24) $Y(\text{John}, \mu\,\text{S. S.})$

(25) $Y(\text{John}, \sigma\,\text{S. S.})$.

I shall now proceed to discuss sentences in which more than one of the particles mo, sae and dake occurs. First, consider the sentence:

(26) John sae S. S. dake o yonda.

(Even John read only S. S.)

I would assume that John is the subject in the sense of logic in (26), the subject marker wa being obligatorily deleted in the presence of sae. Obviously, John is at the same time the syntactic subject of the sentence; the syntactic subject marker is deleted, as usual, in the presence of wa before the latter has been deleted. A less superficial representation of (26) would be: [11]

(27) John ga wa sae S. S. dake o yonda.

or, perhaps:

(28) John sae ga wa S. S. dake o yonda.

The meaning of (26) is that all the persons in question read only S. S. and S. S. is even the only book that John read in spite of the expectation that John would read more because of his intense intellectual curiosity or perhaps that John would rather read some other books because of his antimentalistic propensity, etc., etc.

With the descriptive device that has been introduced above it might appear plausible to represent (26) by the formula:

(29) $Y(\sigma \text{John}, \delta \text{S. S.})$.

But this decision will lead us to some difficulty.

Thus, consider the sentence:

(30) S. S. dake wa John sae ga yonda.

In this sentence the syntactic object S. S. is the subject in the sense of logic;[12] John is only the syntactic subject. The meaning of the sentence is that among all the books in question S. S. is the only one that even John read, who was expected to read the least for some reason or other. [13] Insomuch as our descriptive formal system does not distinguish the subject in the sense of logic, expressions like (11) having been discarded as logically superfluous, (12) would be represented by the same formula as (9), i. e. by (10). It would then follow that (29) would have to be assumed to represent (30) with the same plausibility as it is assumed to represent (26). But (26) and (30) are not synonymous.

A similar situation arises with respect to the combination of mo and dake:

(31) John mo S. S. dake o yonda.

and

(32) S. S. dake wa John mo yonda.

are not synonymous.[14] (31) means everyone including John read only S. S.; (32) means S. S. is the only book that everyone including John read.[15]

But let us now return to (26) and consider its subject-predicate structure intuitively. It was assumed that (26) was obtained by adding sae to John wa in (14), wa being deleted in the presence of sae. The form (14) was in turn obtained from (9) by adding dake to S. S. o.[16] In (9) John is the subject in the sense of logic and the predicate "having read S. S." is said of John. But, then, in (14) one might say that the predicate "having read only S. S." is said of the same subject, John, as in (9). The sentence (26) might now be interpreted to state that this predicate is said "even of John." Assume that one has introduced (11) in order to represent the subject-predicate structure of (1), superfluous though it might at first logically appear. Then, (14) would in turn be represented by the formula:

(33) S(John, Y(——, ∂ S. S.)).

If this expression is taken to represent a predicate, John appears in it as a constant and it may be "bound" by the quantifier-like σ. One then obtains the formula:

(34) S(σJohn, Y(——, ∂ S. S.)).

This formula would be considered to represent (26) with its subject-predicate structure as it has been analyzed just now.

Consider now (30). Here the subject in the sense of logic is S. S. as in (12). In (12) the predicate "being read by John" is said of S. S. In (30) the predicate "being read even by John" is said of S. S. and, furthermore, it is asserted that S. S. is the only subject of which the same predicate can be said. The subject-predicate structure of (12) can be represented by the formula:

(35) S(S. S. , Y(John, ——))

superfluous though it might appear. The formula:

(36) S(S. S. , Y(σ John, ——))

would then represent the subject-predicate statement in which "being read

by John" is said of S. S. Finally, by "binding" S. S. by the quantifier-like $\mathcal{O}$ one obtains the formula:

(37) S($\mathcal{O}$S. S. , Y(σ John, ——)).

This expression would be considered to represent (30) as it is interpreted to be a statement of the subject-predicate structure.

But, notice that (26) and (30) are now represented by different formulas, (34) and (37), respectively. Introduction of "higher predicate" S has turned out not to be superfluous. From this it would be concluded that the significance of the existence of the subject-predicate paradigm in language does not lie solely in "rhetorics."

The main objective of the present study has thus been attained. But I shall have to continue to examine the analysis given above in connection with some other related problems.

Note

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1) The term "subject," and correlatively the term "predicate," too, are, as technical terms in grammar, hopelessly ambiguous in both senses of the word, i. e. , semantically multi-valued and also, often, obscure. A complete account of various concepts of "subject" and of their conceptual and historical relatedness would require a separate volume. The concept of subject which is our main concern in this paper is the one that I assume was intended to be captured by the word "subject" in the original "traditional" theory of grammar, i. e. , the rationalist theory, or more specifically the theory of the Port-Royal logico-grammarians. However, I do not commit myself to, or in fact, as will be seen later, I do not approve of all the consequences and implications of their theory of subject. The concept of subject

in grammar in this sense was asserted to be based on the traditional doctrine of logic (see note 2 on the point). I once used the term "logical subject" with the same intention as here to refer to this concept of subject (Kuroda [1965]). I was aware that the expression "logical subject" was used by later traditional grammarians, but hoped, perhaps helplessly, that my use of the expression would be understood independently of the use of the same expression by those grammarians; my intention could be different from theirs, whatever theirs was. Once when I wrote on a related topic in Japanese, I took advantage of the fact in Japanese that different words are used to refer to logic in the sense of the science of logic and logic in the sense of what constitutes the object of the science of logic, i. e., ronrigaku and ronri; I used the expression ronrigaku-teki syugo (logical subject, or subject in the sense of the science of logic). Following this practice I shall here use the expression "subject in the sense of logic," "logic" here to be understood in the sense of the science of logic, in order to refer to the concept of subject which concerns us here, when there is fear of confusion with some other concepts of subject; otherwise I shall simply say "subject." The expression "subject in the sense of logic" may lead to an unfortunate misunderstanding, if one assumes that the concept thus denoted is implied to be founded on logic in some absolute sense, as such is not the case. An expression less liable to this kind of misunderstanding would be "subject in the sense of the rationalist tradition of logic," but this would hardly be a convenient name.

When I have to mention other concepts usually called by the term "subject," I shall refer to them by the word "subject" modified with an adjective. It must be noted in particular that the concept of subject in the sense of logic, as it is intended here, must be kept apart from the concept of deep subject in the theory of transformational generative grammar. The possibility of a realization of a theory of transformational generative grammar in which the intended concept of subject in the sense of logic can be defined formally in terms of deep structures, or in particular in which it coincides with the notion of deep subject, may not be excluded a priori. But the deep subject in any of the proposed realizations of the standard theory of transformational grammar in the sense of Chomsky [in press] cannot be the subject in the sense of logic. Nor does it correspond to the concept

of surface subject. In fact, so far as I can see, there is no reason to believe that the concept of the subject in the sense of logic can be captured in a direct manner in any realization of the standard theory, or for that matter, even in any realization of the nonstandard theories of the proposed types, except perhaps for possible kinds of descriptions which are trivial and uninteresting, in proportion to complications in formalism of grammar that they would cause to arise, in the way that they would ammount to mere isolated statements, in the guise of formalization, of the fact that such and such constituents of sentences may be interpreted to be the subject. For an attempt to give a description of some aspects of the subject in Japanese that relates it to certain other syntactic phenomena, the reader is referred to Kuroda [1965], Chapter 2. The facts discussed there belong to the same range of phenomena as those which will be taken up here. But this paper does not presuppose familiarity with the previous work.

Perhaps, the subject in the sense of logic might be considered to be just another name for what is called a theme or topic. But these terms are also hopelessly worn out; they would not serve my present purpose without careful and tiresome philological specification. Besides, if in fact some authors had the same intention in using one of these terms as I have with the expression "the subject in the sense of logic," the term theme or topic can be said to have been used itself as another name for the originally intended sense of subject. Scrutiny into this direction belongs to, borrowing Postal's phrasing, "timeless" work of history of linguistics and there is no room for it here.

2) The widely held belief that the traditional grammatical concept of subject is based on the concept of subject in the traditional logic may be accepted without qualification so long as one understands by the traditional logic the "modern" tradition of the traditional logic established or greatly influenced by the Port-Royal logic. To what extent such a belief can also be considered to be valid with respect to the original Aristotelian doctrine is another question. One this point, see Kuroda [in preparation].

3) Incidentally, the question as to whether subjectless sentences exist in the sense intended here may not be confused with the question which can be phrased in the same way but concerns the concept of deep subject.

This latter problem has been taken up by B. Hall [1965].

4) For an account as to why sentences like (3) must be subjectless and for some other discussions related to the problem of subject in general, the reader is referred to Kuroda [1965].

5) As it is not essential to our concern any complication that might arise from attempting to incorporated the tense distinction in formal representations will be ignored in what follows.

6) Henceforth abbreviated S. S.

7) I shall insert here a remark on ga and o, which appear in (9), (12), and (13). It is assumed that ga and o are deleted before wa. Thus, less superficial representations of (9) and (12) would be:

(A) John ga wa S. S. o yonda.

and

(B) S. S. o wa John ga yonda.

It suffices for the present purposes to assume that ga and o are the markers of the "subject" and the "object" of a verb in the sense that they identify the "places" of a logical predicate that would be assumed to represent the meaning of the verb. In other words, if one introduces a logical predicate Y by the definition:

$$Y(a, b) \equiv a \text{ ga } b \text{ o yonda},$$

ga and o indicate that the positions marked by them in the sentence frame correspond to the first and the second place of the predicate Y(,). This characterization of ga and o is valid for simple sentences whose surface structures are sufficiently close to their deep structures. A less straightforward, transformational account would be required to characterize ga and o beyond this limitation. For an attempt of a description of ga and o along this line, see Kuroda [1965], Chapter 6 and [1965a].

One of the main claims of the standard theory of transformational grammar is that the subject and the object of a verb in the sense intended here, which in the case of subject must be clearly kept apart from the concept of the subject in the sense of logic, are the deep subject and the deep object, relational concepts to be defined in terms of deep structures. In the nonstandard theory proposed by Chomsky[1969] it is maintained that this claim of the standard theory remains unchanged. The concept of deep structure as it is proposed in Chomsky [1965] has been called into critisism from various corners.

See for example, Lakoff [1968], McCawley [1967, 1968], Fillmore [1968]. Putting aside such criticisms, I have some doubt that the concepts of the deep subject and object can be maintained to have the significance that Chomsky apparently assigns to them. For this point, see Kuroda [to appear]. As things stand now, then, it would be advisable to avoid using the terms deep subject and deep object to refer to the concepts of "subject and object of a verb" intended here, and thus to stay free of particular claims made in one or another version of transformational theory. Thus, I shall use the term "syntactic subject" and "syntactic object" to refer to the concepts of subject and object of a verb intended here. Besides, this work of a descriptive nature is not based on any strictly defined particular version of transformational theory. In fact the concept of subject in the sense of logic, as a grammatical concept, remains informal in this work, insomuch as I do not intend to make any proposal concerning the question as to how and in what version of a theory of transformational grammar this concept can be defined formally. The concepts of syntactic subject and object here should be understood likewise to be descriptive concepts outside any formalization of the theory of transformational grammar.

8) This expression would perhaps suffice and be convenient for expository purposes, but, strictly speaking it may be said to be an "abuse" of a defining formula. My intension is to construct a formal system in which δ is contained as a primitive symbol. "Defining formula" (18) is understood to describe an intended, "standard" semantic interpretation of δ by means of the standard semantic interpretation of the ordinary system for predicate calculus, and at the same time to "hint at" the formation rules for well-formed formulas that contain δ, informally and implicitly.

9) One might have some doubt about the ways the defining formulas of μ and σ were given here. In fact it is not obvious that the meanings of mo (also) and sae (even) may be said to be paraphrased by means of the existential quantifier. One might wish to describe the meaning of mo by stating that the entity to which it is attached is meant to be a member of the presupposed group of entities of which the same statement holds. Thus, one might as well define μ by

(A) $P(a, \mu b) \equiv P(a, b) \cdot (\forall x)[(x \neq b) \Rightarrow P(a, x)]$.

The right hand side of this formula is of course superfluous, as it is equivalent to ($\forall$ x) P(a, x). The similar reformulation of the definition of σ might also be suggested; in this case the resulting formula will not be superfluous as (A) because of the term represented by ... in (21).

But what is essential here is that we assume the existence of a formal system in which the primitive sympols μ, σ, and δ exist, with the formation rules for formulas that contain them "hinted at" by "defining formulas" such as those given above. It is not essential for our present concern to determine to what extent the intended formal semantic interpretations of μ, σ, and δ described by these "defining formulas" by means of the standard semantic interpretation of the ordinary system for predicate calculus may be taken to be faithful to the intended informal semantic interpretations of μ, σ, and δ by means of the Japanese words mo, sae, and dake.

10) The object marker o is deleted before mo "almost" but not totally obligatorily; the deletion of o before sae would be less obligatory but would increase acceptability of sentences that contain this combination. Thus, the sentences:

(A) John wa S. S. mo yonda.

and

(B) John wa S. S. sae yonda.

would sound more natural than (22) and (23), respectively. Since the purpose of this paper is not practical, I avoid as much as possible complications arising from surface phenomena so long as they are irrelevant to, and likely to obscure, the main points of the arguments, even, to some extent, at the expense of naturalness in terms of acceptability.

11) Since there is no direct surface evidence anywhere that would indicate that wa may coexist with sae some qualifications to the above statement may be in order.

First of all, to assume existence of wa adjacent to sae in an underlying structure of (26) is not the only possible way to account for the fact that John is the subject in the sense of logic of (26). One may as well postulate an "unseen" feature which is shared on the one hand by wa and on the other hand by sae in such occurrences as in (26) and which is to be taken as the marker of the subject instead of wa itself. This assumption would appear

more faithful to the information we have relative to surface appearance of sentences, treating "unseen" elements as unseen. However, occurrences of wa as in (9) or (22) seem to do little more semantically than such a feature would be supposed to do, which would make the assumption of such a feature superfluous. At present no concrete formal evidence to support definitely one or the other of these assumptions is known and I adopt for simplicity of exposition the assumption that the subject is marked by wa. This led us to assume underlying forms like (27) or (28).

Secondly, the judgment according to which John in (26) is taken to be the subject in the sense of logic might itself be challenged. As mentioned in note 10, the object marker o may be deleted in the presence of sae; (23) and (B) of note 10 are assumed to be variant surface forms of an identical underlying structure. A similar assumption might be made with respect to behavior of the syntactic subject marker ga in the presence of sae. The form:

(A) John sae ga S. S. o yonda.

is a well-formed surface structure. If in fact John is the subject in the sense of logic of (26), as I assumed, the difference between (26) and (A) would be only "rhetoric" in a sense similar to the difference between (9) and (13). Hence it would be hard to prove directly at this level of observation the assumption that John is the subject of (26) and to refute the alternative which would assert that (26) is derived from (A) by deletion of ga. But for a reason to be discussed later (in part II) I would maintain that the marker wa may coexist with sae in underlying structures, though such coexistence is not attested in surface structures.

The above remark may not be taken to mean that I disclaim existence of a rule with the effect that ga is deleted in the presence of sae. Such a rule would be needed anyway. See note 12. Then the surface structure (26) might have to be assumed ambiguous. But what matters here is only that (27) or (28) is a possible, if not a unique source of (26).

12) The object marker o is deleted before wa. Incidentlly, deletion of ga in (30) yields another surface form. This fact would suggest that a rule that deletes ga in the presence of sae would have to be set up. See the remark at the end of the preceding note. Note also that wa may be removed

from (30) with little semantic change. This fact would suggest that a rule exists which optionally deletes wa in the presence of dake.

13) Thus, both (26) and (30) imply that S. S. is the only book that John read; (26), but not (30), implies furthermore that all the persons in question read only S. S.

14) In (31) ga and wa are assumed to be deleted in the presence of mo. In (32) ga is assumed to be deleted in the presence of mo.

15) Both (31) and (32) imply that S. S. was read by all the persons in question including John, and further that it was the only book read by John; (31), but not (32), implies further that all the persons including John read only S. S.

In contrast with the pair (26) and (30), or the pair (31) and (32), the pair:

(A) John sae S. S. mo yonda.

and

(B) S. S. mo John sae yonda.

reveals only a semantic difference of the kind that cannot be evidenced in a way similar to the above; the difference may be said to be of a "higher" order.

16) The expresstion "obtained by adding" is not here intended to carry generative implication; I do not intend to commit myself to any generative account that would relate these forms.

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