HALDUR ÕIM

PRESUPPOSITIONS AND THE ORDERING OF MESSAGES

(1) In (Õim, 1972) I suggested how the functioning of language could be described in linguistic semantics; more precisely, how the act of predication, which is taken to be the basic act underlying the communicative function of language, could be described. In the present paper I want to develop one certain point of this approach which was only briefly touched upon in the paper mentioned above, namely the treatment of actual sentences within the framework of the given approach. At the same time I want to show how a certain explication to one of the most discussed notions of present-day semantics – the notion of presupposition – quite naturally follows from this treatment.

There are few notions more popular in the literature on semantics than the notion of presupposition. One may suppose that the extraordinary interest investigators have shown in this notion somehow reflects the importance of the notion in the functioning of language.

But what is the role of presupposition in the functioning of language? How exactly do the phenomena represented by this notion participate in the activities we carry out by means of language? This is not at all clear. Consequently, the appropriate way to handle the presupposition relation in the semantic descriptions of sentences is also quite obscure. For instance, this relation has been connected with the notion of selection restrictions and with the 'appropriateness conditions' of the corresponding sentences; it has been proposed to treat this relation as a primitive predicate to be contained directly in the semantic representations of the corresponding sentences; and it has been treated as a logical relation between sentences, alongside such relations as entailment and implication.

Attention has mainly been directed towards the logical properties of this notion, not towards its function. This in its turn seems to result from a general striving within generative semantics towards logic; from an inclination to consider language as a certain logical system and nothing more. But such an approach, it seems to me, is too abstract for linguistics. The requirements presented by it are too general. In the context of this approach we are unable to understand or handle in any definite way many facts of language, among them the facts connected with presupposition. In solving concrete problems a situation often arises where many solutions to a problem are logically possible and we are unable to prove the superiority of one solution above the others.

F. Kiefer (ed.), Trends in Soviet Theoretical Linguistics, 123–134. *All Rights Reserved. Copyright © 1973 by D. Reidel Publishing Company, Dordrecht-Holland.*

As I have said, in the present paper I want to offer a definitely new treatment of some of the phenomena connected with presupposition, departing from a general approach to semantics in which attention is primarily directed towards the functional aspect of language.

(2) As stated above, the general approach from which I will depart here is described elsewhere (Õim, 1972). Here I will present only the main points of this approach that are significant with respect to the present discussion.

The specific context from the point of view of which I want to discuss the problems of semantics is the context of communication. As I see it, language is above all man's instrument of communication It is this function, first of all, that has shaped the structure and logical properties of language and, accordingly, it is just this function that we should depart from in investigating them. Such a proposal is not very original in itself, of course. The important question however, is, how to specify the notion of communication in linguistics. How useful the corresponding approach will be depends on the definition of this notion.

In the most general terms, I am treating communication as the transformation of particular structures (by the hearer) under the influence of the received messages. And sentences, which we have to describe in linguistics, are the units of this process. It is from this fact that they derive their role as basic units in any language.

What does this 'transforming' concretely consist in, considered on the level of individual sentences? Communication carried out by means of natural language, is, as a rule, about something – about certain objects, persons, places, events, etc. The recipient (the hearer), when he receives a message, should be able to identify the corresponding objects which the message is about – i.e. he should have certain descriptions of these objects in his memory. And receiving a message that tells some new information about them means, from the point of view of the recipient, that he has to modify the corresponding descriptions in a certain way Thus, the semantic description of a sentence, taken from this point of view, should specify at least the following points: (1) what 'objects' the sentence is about, i.e. to the knowledge of which it contributes something; (2) what constitutes the hearer's previous knowledge of each of these objects; (3) what new information about each of these objects the hearer receives from the given sentence and, accordingly, what modifications are to be carried out in the descriptions of these objects.

It should be pointed out that such an 'information processing approach' is generally accepted in computational linguistics (see, e.g., Quillian, 1969; Schwarcz, 1969), but in linguistics proper it has been generally assumed that the linguistic information by itself does not suffice for specifying points (1)–

(3) in the case of a concrete sentence. This is a confusion, I think. The problem is quite parallel, e.g., to that of specifying the truth conditions of sentences: just as specifying the conditions upon which the truth of a sentence depends is quite different from saying whether a concrete sentence is really true or not, specifying points (1)–(3) in the abstract, or logical, sense is also quite different from deciding in a concrete case what the recipient really knows about the corresponding 'objects', what new knowledge he practically can derive from the sentence, etc. Exactly as we can specify abstractly for every individual predicate its truth conditions and from these derive the ones of complex expressions, so it should be possible to determine for every individual predicate, as a part of the description of its meaning, the modifications it carries out in its arguments, when asserted, and to determine the processing of actual sentences departing from the rules associated with individual predicates contained in them. The treatment of single predicates is described in some detail in (Õim, 1972). To give here only a rough example, let us take such a verb as *to awake* If it is asserted about some x that x awoke, x should previously have been identified as having been asleep (in addition to other facts that *to awake* requires from its subject – such as being animate, etc); i.e., x's description should contain the information 'x is asleep'. And the assertion of the predicate *to awake* changes this description into the one where on the place of this information stands 'x is awake'.

I will not try to describe here what the descriptions of such arguments would look like and how their processing should be represented formally, since this is of no principial importance for the treatment of the problems I am interested in here. Some considerations about the nature of the needed formalism will be presented below. Here, I will assume that every predicate represents certain rules for transforming its arguments in a definite way and that the assertion of a predicate means applying these rules. I will concentrate my attention on the question of how the representation of an actual sentence can be built up from the representations of the individual predicates contained in it.

(3) In (Õim, 1972) I emphasized two points in the treatment of actual sentences: first, that in the case of a concrete sentence all the logically possible ways of interpreting it as a message should be described (and not only the most typical or usual one); and second, that in every such interpretation the corresponding sentence breaks up into a number of single messages, and these messages are always ordered in a certain way with respect to each other.

The reason for analysing sentences into elementary messages and for ordering them into a definite sequence lies in the fact that this order represents

Since I am treating presuppositions as previous messages about the corresponding objects, the hierarchies of presuppositions, as established by Lakoff, should logically be the same thing as the sequences of messages which I mentioned above. And it is not difficult to see that they are indeed identical. Moreover, by dealing with the hierarchies of presuppositions it can be shown that the treatment of actual sentences by means of such ordered interpretations as I am offering here is not an artificially established procedure but rather represents the typical way sentences are interpreted in actual communication. Consider the following example:

(7) The boy hit the ball,
(a) if anyone hit it at all.
(b) if he hit anything at all.
(c) if he did anything at all to the ball.

The sentence (clause) (7) can be followed by any of the qualifying phrases (a)–(c), which means that 'Someone hit the ball', 'The boy hit something' and 'The boy did something to the ball' represent first-order presuppositions of the sentence 'The boy hit the ball'. But, of course, not all at once and in one and the same sense. We cannot add the phrases (a)–(c) to the sentence (7) all at once. Each of these phrases determines a certain interpretation of the sentence (7); and, accordingly, each of the presuppositions corresponding to the phrases (a)–(c) is an immediate presupposition only for one particular interpretation of this sentence. The difference between these interpretations lies in the different orderings of the material contained in this sentence. For instance, the phrase (a) is appropriate, if the sentence (7) is interpreted as 'The one who hit the ball was the boy'; the phrase (b), if (7) is interpreted as 'What the boy hit was the ball', etc.

Note also that each of the phrases (a)–(c) determines a certain possibility for locating emphasis in the sentence (7): for instance, in the case of (a) only *the boy* can be emphatically stressed, not *hit* or *the ball*. As the function of emphasis in such cases is to indicate where the new, lastly asserted information in the corresponding sentence lies, it can be said that in actual communication sentences are always interpreted *in the way that becomes evident in the case of emphasis*: the role of emphasis is not to introduce order into the semantic material contained in a sentence; the order is always there – the role of emphasis is only to indicate this order when it differs from some basic or neutral order in a definite way.

Thus, as is evident from the given context, the relation of presupposition is a kind of order-establishing relation. Morgan (1969) reaches practically the same conclusion:

the relationship between unuttered presuppositions and the sentence with which they are connected is exactly the same as that between a left-conjoined sentence and the conjuncts that follow. By all indications, presuppositions are somehow conjoined to the left of the performative.

The only trouble with such a characterization is that in the usual conception of generative semantics such a left-to-right ordering has no clear theoretical significance: of course, we can write the corresponding propositions in this order, but what will this mean? On the other hand, in the present model the order has an unequivocal significance: this is the order in which the corresponding messages are processed.

Let us now consider in more detail what an ordered semantic treatment of actual sentences consists in. As has been stated earlier the present approach is based on the treatment of individual predicates as presenting definite rules for modifying the information presented by their arguments. In the treatment of an actual sentence every predicate (predicative structure) contained in the sentence should be processed according to the rules that the predicate represents. I.e., in the semantic description of a sentence to every predicate contained in it there corresponds its own message; as a whole, the sentence seems to be a program offered to the recipient for computing new descriptions of certain objects in his memory.

Let us take the following sentence for closer examination:

(8) The boy took a book from the table.

As has been stated above, the full description of such a sentence consists, first, in determining all the different possibilities of using it as a concrete message and, second, in describing each of these interpretations separately. The sentence (8) apparently represents at least the following different messages.[1]

(9) Where the boy took a book from was the table.
(10) What the boy took from the table was a book.
(11) The one who took a book from the table was the boy.
etc.

Let us take one of these interpretations and try to establish the sequence of

[1] I do not want to consider here the problem of how this should be decided when all the possible interpretations of a sentence are specified. I think some of the general criteria for such a decision can be found by dealing with the second half of the problem: when a certain combination of the material contained in the sentence will determine a different way of processing this material, in comparison with other combinations, and when not. As to the form of the sentences used here for presenting the interpretations, this has been chosen with the intention that from this it could be explicitly seen what the immediately asserted unit of the corresponding sentence is. Note that sentences of this type have been analysed in detail in Halliday (1967).

messages which correspond to it. Let this be the interpretation (10). In establishing the 'previous' messages corresponding to it we can make use of some well-known criteria used in establishing the presuppositions of a sentence, first of all the following one: if *B* follows logically both from *A* and the negation of *A*, then *B* is a presupposition of *A*. Thus, we have to take sentence (10) and to establish all the sentences that represent its presuppositions, after which we take these latter sentences and establish their presuppositions, and so on. And in establishing the proper order among these sentences we can use the 'if at all' test (and other tests of this type). The final outcome of such an analysis should be the string of messages that has logically preceded the given message.[2]

Operating as described above we establish in the given case the following sequence of messages:

(a) There was a boy_i.
(b) The boy_i did something.
(c) What the boy_i did was that he took something from somewhere.
(d) There was a table_j.
(e) Where the boy_i took something from was the table_j.
(f = 10) What the boy_i took from the table_j was a book.

For instance, it is easy to see that both from (f) and from its negation 'What the boy_i took from the table_j was not a book' it follows logically that the boy_i took something from the table_j (=e). That this presupposition is an immediate one is revealed by the fact that sentence (12) is possible:

(12) What the boy_i took from the table_j was a book, if he_i took anything from the table_j at all.

On the other hand, (f) also clearly presupposes, e.g., the sentence (d) – i.e. that there was a certain table. But the strangeness of the sentence (13) shows that this is not a first-order presupposition of (f):

(13) What the boy_i took from the table_j was a book, if there was a table at all.

Instead, (14) reveals that (d) is an immediate presupposition of (e):

(14) Where the boy_i took something from was a table, if there was a table at all.

Note that in the above sequence there are messages 'There was a boy_i' and 'There was a table_j' that explicitly introduce the corresponding objects (the

[2] I emphasize here the word 'logically'. As has been stated already, this is only a logical description of how the communication has proceeded. No claim is made as to how the corresponding information in reality has reached the hearer.

boy_i and the $table_j$) into the discourse, but there is no message in this sequence that asserts the existence of the third object mentioned in the sentence (10) – the corresponding book. Although it follows from (10) that such a book should exist, this is not presupposed by (10). From the negation 'What the boy_i took from the $table_j$ was not a book' nothing can be concluded about the existence of a particular book.

As the above list shows, the sequence of messages which correspond to a sentence is generally not strictly linear. The sequence starts with a certain 'line' (here, the 'boy_i-line'), but as the sequence proceeds, certain new 'lines' may appear. For instance, in the given case the message (d) introduces a new line – the '$table_j$-line', which in the next message (e) joins the former 'boy_i-line'. If in the sentence (10) there were more NP's in the nonassertive position than just the NP's *the* boy_i and *the* $table_j$, then there would also be more such 'lines'; and if, for instance, *the* $table_j$ had some attributes, its 'line' would also be longer.

Bearing in mind that we want the sequence (a)–(f) to be a logical description of how all the information contained in (10) can be carried to a recipient, it is natural to ask whether the messages (a)–(f) exhaust the information a recipient can logically derive from (10). Of course, this is not the case. Beside the facts presented in (a)–(f), as the recipient understands it he should also derive the following information from (10):

(g) The book really existed.
(h) The book was (previously) on the $table_j$.
(i) (After the fulfilment of the act described in (10)) the book was not on the $table_j$.

It is also evident why these messages remained outside of the earlier list. We constructed that list on the basis of the presupposition-relation, and although (g)–(i) follow logically from (10), they are not presuppositions of this sentence. What this means is the trivial fact that there are other logical relations, besides the relation of presupposition, which are also involved in interpreting the sentences in communication.

Nevertheless, this fact does not contradict the idea of a linear treatment of sentences. It only means that we should not rely strictly on the relation of presupposition when we establis the sequences of messages which correspond to actual sentences.

The semantic relation involved in the given case is apparently what has been called implication (in its weaker sense).[3] Since it is clear that the mes-

[3] See (Karttunen, 1970a, 1970b). The relation is defined as follows: *A* implies *B* if and only if, whenever *A* is true, *B* is also true. It has also been called semi-entailment, as Karttunen reports (Karttunen, 1970b).

sages (g)–(i) have a quite definite influence upon the information that ultimately will hold about the objects mentioned in the sentence (10), we have to include them in the sequence of messages which correspond to this sentence. But since they are not presuppositions, they cannot precede the assertion proper of the sentence, but should follow it; i.e., the operations represented by them will be carried out only after the assertion proper has itself been processed. Such a treatment is in full agreement with the properties of the relation under consideration, in particular, with the fact that when the sentence (10) is negated, the messages (g)–(i) no longer follow from it. As the negation of (10) means (among other things) that the operations corresponding to its assertion proper (f) will not be carried out, it is natural that the given messages cannot be processed either.

(4) Let us now turn to the questions raised in Section 2. How will the given treatment answer these questions?

First, what 'objects' is sentence (10) about? There are three objects whose existence is explicitly asserted in the sequence (a)–(i): the boy, the table and the book. The hearer receives a certain amount of information from the given sentence about each of them. He has to create a description for each of these objects and to modify it, according to how the new information is provided in the sequence.

I do not want to say that only the descriptions of those 'objects' whose existence is explicitly asserted in the corresponding sequence can result from a sentence, but this is clearly one of the criteria. What other criteria should be used is not very clear yet and I will leave this question out of consideration here. (Some of the needed criteria can surely be found if we deal with the anaphora: what types of 'objects' we can refer back to in the course of communication; but this question also needs special study.)

The main point that such a sequence of elementary messages is thought to explicate is related to the questions (2) and (3) above, i.e. how the information carried by a sentence is added to the descriptions of the corresponding objects. Through the sequence (a)–(i) it is not difficult to follow how the information is gathered in the case of each of the mentioned objects, that is, how every new message adds something to the previously given material. (It must only be taken into account that we conventionally took all the words in the analysed sentence to be elementary; in order to get the complete picture of what is actually going on we should analyse every word into elementary predicates and process every such predicate separately.) In this connection it is important to draw attention to the form of the sentences which present the messages. As has been stated above this form has been chosen, first of all, because it unambiguously reveals the assertion proper of the corresponding sentence. But this form deserves attention in yet another

respect. Namely, when we look at the sentences (c), (e) and (f), we observe that the common structure of these sentences is such that the first half the sentence *(What the boy$_i$ did, Where the boy$_i$ took something from, What the boy$_i$ took from the table$_j$)* 'picks out', or 'identifies', a certain variable, while the other half of the corresponding sentence *(he$_i$ took something from somewhere, the table$_j$, a book)* supplies the concrete value to be given to the corresponding variable. This apparently suggests that communication should generally be treated as a process where concrete values are substituted for the corresponding, previously identified variable. Every single message presents an operation of substituting a concrete value for a certain variable. The sequence of messages (a)–(i) represents the sequence of such substitutions which corresponds to the whole sentence (10).

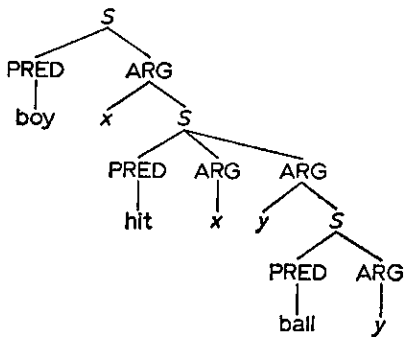
Of course, the 'concreteness' of every such value to be substituted in a concrete case is quite relative. The value may itself have certain aspects that need concretization. But the important fact is that communication can be treated as proceeding through just such a gradual determination of more and more concrete values. In the above case, for example, a certain individual, the boy, is first introduced in (a), and in the second message one aspect of this individual is selected with respect to which the meaning of the word *the boy* itself is not determined and, accordingly with respect to which it is possible to add certain new information – that the boy is involved in a definite activity. The information about this activity is then made more concrete in (c) by saying that the activity consisted in the boy's taking something from somewhere, but, as we see, two new variables appear which in their turn must be concretized: what it was the boy took and where he took it from; and so on.

Furthermore, it must be noted that in the course of the given sequence only one aspect or variable of the concept 'the boy' receives a concrete value. We come to know something only about the activity the given boy was involved in. But many other variables remain unconcretized. We do not know anything, e.g., about his characteristics as a person: how old he is, or how tall, or what kind of character he has, etc. As the communication about the boy proceeds, all these aspects can be given a concrete value. What I want to emphasize is that from the point of view of the present approach there is no difference between the way such variables are connected with the concept of a person and, e.g., the way the 'who', 'what' and 'from where' variables are connected with the concept of taking. In both cases we have to do with certain variables to which concrete values can be (or should be) given in communication. And the former are logically as inseparable from the concept of a person as the latter are from that of taking: just as we cannot imagine a concrete instance of taking without someone who is performing

the act of taking, without something that is taken and without some place from where it is taken, we cannot also imagine a concrete person without a definite age, a definite height, a definite character, etc. And, of course, the concept of person is not any exceptional phenomenon in this respect, e.g., in the case of a thing we speak exactly in the same way of its size, shape, weight, etc, or in the case of a motion of its direction, speed, etc.[4]

This brings us to the problem of the form in which the semantic descriptions of sentences should be given in order for these descriptions to satisfy the requirements presented by the described approach. There is quite little I can say about this question here.

The question of the form of the semantic representations of sentences, as understood in the above sense, actually breaks into two questions: (1) what form should the identifying (or argument) structures have that are modified in the course of processing the corresponding messages, and (2) what should the form of sentences as wholes be – the form that could determine the process of modifying, step by step, the corresponding identifying structures. It should be quite clear that the usual phrase structure trees, as they are used in generative semantics, do not suit our purposes. One need only try to imagine, e.g., the tree corresponding to the sentence (8) (or (10)) which we analysed: how could we possibly read out from such a tree the information represented by the sequence (a)–(i)? In my previous paper (Õim, 1972) I have used a form of representation where the presuppositions about a certain object are attached in the form of relative clauses to the index that represents this object and where the processing of the whole tree proceeds from the bottom up. For instance, according to this procedure, the sentence 'The one who hit the ball was the boy' receives the following representation



'There was a ball. Someone hit the ball. The one who hit the ball was the boy.'

[4] For a little fuller treatment of these questions see Õim, (1971).

It is not difficult to see, however, that such a form of representation is suitable only for the simplest cases. When we take into account the remarks made above about the possible treatment of communication, it becomes especially clear that the simple predicate-argument structures do not offer any adequate means for representing this process. The foregoing discussion suggests instead that something of the so-called attribute-value type of representations would be much better suited to our purposes. It is not a coincidence, I think, that just this form of representation has been used in so many systems of computational linguistics. If we look for some linguistically acceptable formalism that would correspond to this form of representation, we find that among the ones used so far in linguistics Fillmore's case structures come closest to it. The notion of case need only be considerably extended, to be able to include also attributes of the above type (such as 'size', 'shape', 'color' etc. in the case of a thing, or 'age', 'sex', etc. in the case of a person). In the case of such attribute-value structures it would be possible to explicate quite easily the fact that communication consists in substituting concrete values for the variables (attributes) contained in the corresponding concepts and, in particular, the fact that the meanings of most words can be described as structures where the values of certain variables are already given, whereas those of certain others are not and can be supplied in communication.

Tartu University

BIBLIOGRAPHY

Halliday, M. A. K.: 1967, 'Notes on Transitivity and Theme in English II', *Journal in Linguistics*, No. 2.

Karttunen, L.: 1970a, 'Implicative Verbs', *Language*, No. 6.

Karttunen, L.: 1970b, 'Some Observations on Factivity', Paper presented at the 45th Annual Meeting of the Linguistic Society of America in Washington, D.C., December 29, 1970.

Lakoff, G.: 1970, *Linguistics and Natural Logic*, Studies in Generative Semantics No. 1, Phonetics Laboratory, University of Michigan.

Morgan, J.: 1969, 'On the Treatment of Presupposition in Transformational Grammar', *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society*, Chicago, Illinois, pp. 167–177.

Quillian, M. R.: 1969, 'The Teachable Language Comprehender: A Simulation Program and Theory of Language', *Communications of the ACM* **12**, 459–476.

Schwarcz, R. M.: 1969, 'Towards a Computational Formalization of Natural Language Semantics', International Conference on Computational Linguistics, Stockholm, Preprint No. 29.

Õim, H.: 1971, 'Predicates, Nouns and Referring Structures', *Abstracts of the Annual Meeting of the Research Group for Generative Grammar*, Tartu State University, Dept. of Estonian Language.

Õim, H.: 1972, in F. Kiefer and N. Ruwet (eds.), 'On the Semantic Treatment of Predicative Expressions', *Generative Grammar in Europe*, D. Reidel Publ. Co., Dordrecht, Holland.