

The Accessibility of Deep (Semantic) Structures*

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Given the conception of language which asserts that for each sentence in a language there is a deep semantic representation and a surface syntactic representation of it, the question is raised: why is there a surface syntactic representation at all; or to put it slightly differently, why are there grammatical rules to convert deep structures into surface structures; or again, why are there transformations?

The fact that transformations exist is a fact that demands explanation, for an "ideal" language would be one which provided direct phonological realizations of its semantic structures. Such an explanation should be based, moreover, on considerations which are independent of such internal linguistic considerations as that a child could not acquire his native language from primary linguistic data unless he assumed the existence of transformations. And such an explanation most certainly should not be in terms of simplicity considerations alone; these are appealed to only in the absence of more powerful modes of explanation from outside. In this paper, we shall show that a partial explanation for the existence of transformations on the basis of considerations of the function of language as an instrument of communication--the communication of that which is given in deep structure representations--can be given.

Chomsky has pointed out in a number of places that the relative unacceptability of particular sentences is due to the internal complexity of their surface syntactic structures; thus a sentence such as (1) with three degrees of self-embedding, although completely and fully grammatical, is quite unacceptable:

- (1) The rumor that the report which the advisory committee submitted was suppressed is true is preposterous.

To distinguish cases of sentence unacceptability arising from internal complexity from other cases, let us say that sentences

such as (1) have deep structures which are relatively inaccessible. We will also say that their surface syntactic structures do not provide ready access to their deep structures.

Now consider the sentences:

- (2) The rumor that it is true that the report which the advisory committee submitted was suppressed is preposterous.
- (3) The rumor is preposterous that it is true that the report which the advisory committee submitted was suppressed.
- (4) The rumor that it is true that the report was suppressed which the advisory committee submitted is preposterous.
- (5) The rumor is preposterous that it is true that the report was suppressed which the advisory committee submitted.

Sentences (2)-(5) all have the same deep structure as (1), yet their surface structures provide relatively greater access to that deep structure than does (1). The reason for this is that various extra-position transformations have been applied to obtain the surface structures of (2)-(5), reducing their degree of self-embedding. In (2), the that-clause subject of the adjective true has been extraposed to the end of the clause containing it, leaving behind the pronoun it as the surface subject of it. In (3), moreover, the that-clause complement of the noun rumor has been extraposed to the end of the main clause. This rule has also been applied in (5). In (4), the relative clause modifying the noun report has been extraposed to the end of the clause containing it. This rule has also been applied in (5). The results are that the degree of self-embedding has been reduced to two in sentence (2), to one in sentences (3)-(4), and to zero in sentence (5). Thus, sentences (2)-(5) provide more ready access to the deep structure common to (1)-(5) than does (1), (5) more so than (2)-(4), and (3)-(4) more so than (2). Now, if the effect of the various extraposition transformations is to render

certain deep structures more accessible than they would be if those transformations were not applied, then we can say that the existence of these transformations is motivated (explained) on the grounds that they facilitate communication of certain deep structures.

Similarly the optional or obligatory character of certain transformations under particular conditions can be explained. For example, it is known that the extraposition of that-clause subjects of intransitive verbs such as seem is obligatory, while the extraposition of that-clause subjects of transitive verbs such as prove is optional. The reason for this is that the application of the extraposition transformation to that-clause subjects of intransitive verbs never decreases accessibility, while the extraposition of that-clause subjects of transitive verbs may. To see this, consider the sentences:

(6) That Tom's told everyone that he's staying proves that it's true that he's thinking that it would be a good idea for him to show that he likes it here.

(7) It proves that it's true that Tom's thinking that it would be a good idea for him to show that he likes it here that he's told everyone that he's staying.

Sentences (6) and (7) have identical deep structures, however the surface structure of (7), obtained by application of the extraposition transformation to its subject that-clause, provides less ready access to its deep structure than does (6). Therefore, the extraposition transformation must be free not to apply to such that-clauses (that is, its application in such circumstances must be optional), so that the most accessible surface structures of particular deep structures will be grammatical.

A similar situation presents itself with regard to the so-called particle-movement transformation in English whose application can be detected in such sentences as:

(8) A sudden gust of wind knocked him down.

(9) A sudden gust of wind knocked the old man down.

In case the object of the verb is a personal pronoun, the particle movement transformation is obligatory, but if it is not, then the transformation is optional. Thus (10) is ungrammatical while (11) is not:

(10) *A sudden gust of wind knocked down him.

(11) A sudden gust of wind knocked down the old man.

In Ross (1966), it was suggested that the transformation be considered inapplicable in case the object noun phrase is complex; that is, contains a subordinate clause. Thus (12) was considered grammatical, but not (13):

(12) A sudden gust of wind knocked down the man who
I saw get out of a car a few minutes ago.

(13) A sudden gust of wind knocked the man who I saw
get out of a car a few minutes ago down.

However, rather than consider (13), and sentences like it, ungrammatical, it would be more in accordance with fluent English speakers' intuitions of grammaticality to consider them fully grammatical, but relatively less acceptable than their counterparts in which the particle movement transformation has not applied. Such sentences are also less accessible than their counterparts, as the following examples dramatically illustrate:

(14) The assailant knocked the man who put the
rebellion which caused the banks to close down
down down.

(15) The assailant knocked down the man who put down
the rebellion which caused the banks to close
down.

Consequently, the particle movement transformation must be optional (at least when the object noun phrase is not a personal pronoun) so that the surface structures which provide greatest access to deep structures such as that which underlies (14)-(15) will be grammatical.

From these examples, it should be clear that a genuinely explanatory theory for the existence of transformations, their effects on the structure of sentences, and the conditions under which they are optional or obligatory can be worked out, at least in part, along the lines suggested here. We do not assert that for every well-formed deep structure there is a surface structure which provides ready access to it--one can imagine, at least, an English sentence so complex that the various extra-position transformations would reduce its deep structure complexity only to reintroduce it elsewhere--but simply that transformations are designed to apply so as to increase accessibility and that their application is suspendable in those situations in which such application would in fact decrease accessibility.

In the examples considered so far, degree of inaccessibility had to do with degree of self-embedding in surface structures. There are, however, other reasons why a surface structure will not provide ready access to the deep structures underlying it. Consider the fact that the relative pronoun may be deleted except when it stands for the subject of its relative clause:

- (16) The class which/that I will teach next semester will meet in the evening.
- (17) The class I will teach next semester will meet in the evening.
- (18) The class which/that regularly meets in the seminar room has been moved downstairs.
- (19) *The class regularly meets in the seminar room has been moved downstairs.

If (19) is imagined as a possible surface structure for the deep structure expressed by (18), in which the relative pronoun deletion transformation has not been applied, it will be seen that it does not provide access to that deep structure, since indication of the subordinate status of the relative clause has been destroyed. The same is not true of sentence (17), since the subordinate status of the relative clause in it is still indicated by the presence of the subject and verb of that clause.

Thus the inapplicability of the relative pronoun deletion transformation in case the pronoun stands for the subject of its relative clause results in the ungrammaticality of surface structures which fail to provide access to their corresponding deep structures. And, although accessibility theory cannot provide a direct explanation for the existence of the relative pronoun deletion transformation in the first place, there may be an explanation in terms of the desire for parsimony (this is by no means an entirely unserious proposal).

We can account, on similar grounds, for the fact that when the relative pronoun stands for the subject of a subordinate clause inside the relative clause, the subordinating conjunction that introducing that subordinate clause must be deleted. Thus the following sentence is grammatical:

- (20) The committee which I understand investigated
the accident has not yet made its report public.

but not:

- (21) *The committee which I understand that investi-
gated the accident has not yet made its report
public.

The subordinating conjunction may, however, be retained in case the relative pronoun stands for some other noun phrase in the subordinate clause. Thus both of the following sentences are grammatical.

- (22) The accident which I understand the committee
investigated was the worst in the state's
history.
- (23) The accident which I understand that the
committee investigated was the worst in the
state's history.

The ungrammaticality of (21) stems presumably from the fact that the retention of that would lead to a false parsing of the sentence, in which that is taken to be the subject of the subordinate clause. This means, of course, that (21) fails to provide access to the deep structure underlying it and sentence

(20); the obligatory deletion of the subordinating conjunction may then be understood as a means of rendering certain surface structures which do not provide ready access to their deep structures ungrammatical.

From the foregoing considerations, we see that accessibility and grammaticality are partially independent, partially dependent notions. From our consideration of the various extra-position transformations and the particle movement transformation, we saw that certain surface structures which fail to provide ready access to their deep structures need not be ungrammatical; there need only be grammatical surface structures which do provide more ready access to them. On the other hand, we saw from our consideration of the relative pronoun and subordinating conjunction deletion transformations, that certain other surface structures which happen to fail to provide ready access to their deep structures also turn out to be ungrammatical.

Given the conception of deep structures as semantic structures, it is apparent that for any well-formed deep structure, there must be at least one grammatical surface syntactic realization of it. The conception of the transformational component as a filter, to weed out unwanted deep structures, cannot in the present theory be seriously maintained. This position has some interesting consequences. For example, it is known that there are no grammatical surface structures in which the semantic content of the following sentences can be expressed as single non-compound sentences:

(24) *The landlord is upset about the window which
I saw the boy who broke it.

(25) *The committee which I wonder whether it investigated the accident has not yet made its
report public.

These facts would appear to contradict the thesis just maintained, since although the semantic content of (24) and (25) is straightforward (hence there must be deep structures which underlie them), there are apparently no grammatical surface structures

by which they may be expressed. But in fact there are, namely the compound sentences:

(26) I saw the boy who broke the window and the landlord is quite upset about it.

(27) I wonder whether the committee investigated the accident; it has not yet made its report public.

The fact that relative clauses arise from deep structure conjunctions has recently been established by Annear (1967); these observations suggest that the ungrammaticality of sentences containing relative clauses in which the relative pronoun has been drawn from a relative clause or a subordinate clause introduced by a subordinating conjunction other than that is due to the fact that such sentences provide relatively less access than do their coordinate sentence counterparts. Example (24), in turn, is more nearly grammatical, and provides greater access to its deep structure, than the following, in which the final pronoun it has been deleted:

(28) *The landlord is quite upset about the window which I saw the boy who broke.

Examples like (24), which often turn up in the speech of English speakers, are usually thought of as making the best of a bad job--a speaker having found himself relativizing out of a relative clause retains a pronoun in place of the noun phrase so relativized, thus providing himself and his audience with a trace of the deep structure, and thus rendering that deep structure more accessible than it otherwise might have been.

References

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